International Labour Organization

ILO global estimates on migrant workers

Results and methodology

Special focus on migrant domestic workers

Labour Migration Branch
Conditions of Work and Equality Department

Department of Statistics

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INTERNATIONAL LABOUR OFFICE GENEVA

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Preface

In today's globalized world, labour migration is a rising policy priority. Economic hardship and geopolitical crises leading to the lack of decent work are resulting in growing and diverse migratory movements. In many economies, including emerging economies, ageing populations and declining labour forces are also contributing to the growing mobility of workers. Women are joining migration flows in growing numbers as independent workers, with important consequences for gender equality in countries of origin and destination alike.

Migration flows have changed over the past few decades, growing significantly in some corridors and between countries of the South. The governance challenges have increased in complexity. There is a need to understand these dynamic migrant flows and their implications for labour markets, particularly in migrant-dominated sectors.

New thinking and new approaches to the governance of labour migration are needed: a fair sharing of the prosperity migrant workers help to create, and policies that respond equitably to the interests of countries of origin and destination, as well as to migrant workers, employers and national workers.

To be effective, such policies must be grounded in strong evidence. For this, data on the number of migrant workers, their distribution by sector and their employment patterns are badly needed.

While acknowledging the many challenges of data collection and analysis in this field, the present global estimates developed by the ILO aim to fill in part of the current knowledge gaps.

This report is part of a broader ILO effort to improve the collection and production of labour migration statistics at national, regional and global levels. These estimates will contribute to the implementation of Resolution IV concerning further work on labour migration statistics, adopted by the 19th International Conference of Labour Statisticians (ICLS) in 2013, which called upon the ILO to carry out preparatory work for defining international standards on labour migration statistics, in close consultation with interested countries, the social partners and civil society organizations. The results of this work will contribute to the next ICLS discussion in 2018 and the development of international concepts and standards on labour migration statistics agreed worldwide.

It is hoped that these estimates will help to advance the national and international debate on migration policy and governance.

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Michelle Leighton, Chief of the ILO Labour Migration Branch, provided strong guidance and support throughout the process, and contributed to the content of the report. Very helpful comments on draft versions were received from (in alphabetical order): Coffi Agoussa, Ryszard Cholewinski, Tite Habiyakare, Steven Kapsos, Samia Kazi-Aoul, Amelita King-Dejardin, Jaewon Lee, Malte Luebker, Maria Elena Valenzuela, Hans Van de Glind and three anonymous peer reviewers. The report also benefited from further inputs from Manuela Tomei, Director, ILO Conditions of Work and Equality Department (WORKQUALITY), Rafael Diez de Medina, Director, ILO Department of Statistics and Charlotte Beauchamp, Office of the ILO Deputy Director-General for Policy.

Valuable comments on the estimates methodology formulation were provided by: Migration Section, Demographic Analysis Branch, United Nations Population Division, Department of Economic and Social Affairs (DESA); International Migration Division (IMD), Directorate for Employment, Labour and Social Affairs, Organisation for Economic Co-operation and Development (OECD); Statistical Division, United Nations Economic Commission for Europe (UNECE); and Migration Research Division, International Organization for Migration (IOM).

This ILO report includes statistical approaches that were developed with support from ILO technical cooperation projects funded by the Swiss Agency for Development and Cooperation (SDC). The estimates on migrant domestic workers in this document were produced with the financial assistance of the European Union. The views expressed herein can in no way be taken to reflect the official opinion of the European Union.

Data sources

This report is based in part on data from the UN Department of Economic and Social Affairs (UN DESA), the Organisation for Economic Co-operation and Development (OECD) and the Integrated Public Use Microdata Series (IPUMS).

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Acronyms and abbreviations

ASEAN	Association of Southeast Asian Nations
DIOC	Database on immigrants in OECD countries
EAPEP	Estimates and projections of the economically active population (also EPEAP)
GCC	Gulf Cooperation Council
ICLS	International Conference of Labour Statisticians
ILMS	International Labour Migration Statistics (database)
IPUMS	International Public Use Microdata Series
ISCO	International Standard Classification of Occupations
ISIC	International Standard Classification of All Economic Activities
JPKE	Department of Economic Planning and Development (Brunei Darussalaam)
ILOSTAT	ILO database on international labour statistics
LFPR	labour force participation rate
LFS	labour force survey
MOHRSS	Ministry of Human Resources and Social Security (China)
OECD	Organisation for Economic Co-operation and Development
UN DESA	United Nations Department of Economic and Social Affairs
UNECE	United Nations Economic Commission for Europe
UNHCR	United Nations High Commissioner for Refugees
UNWRA	United Nations Relief and Works Agency for Palestine Refugees in the Near East

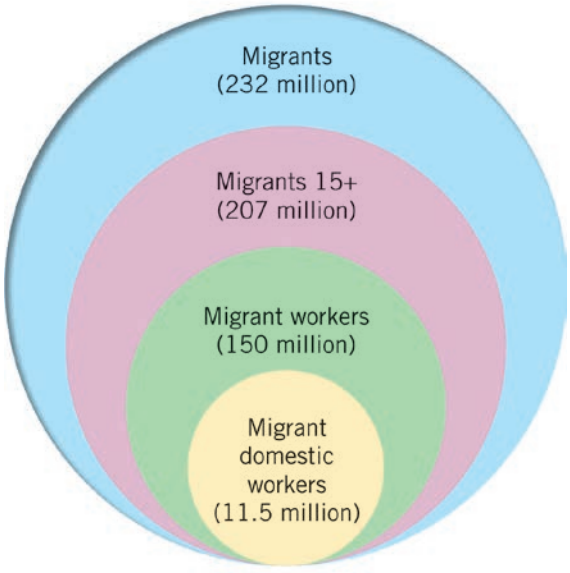
Executive summary

The ILO estimates that 150 million people are migrant workers

According to recent ILO estimates, there are 150.3 million migrant workers in the world. Of these, 11.5 million are migrant domestic workers. The term "migrant worker" refers to all international migrants who are currently employed or are unemployed and seeking employment in their present country of residence.

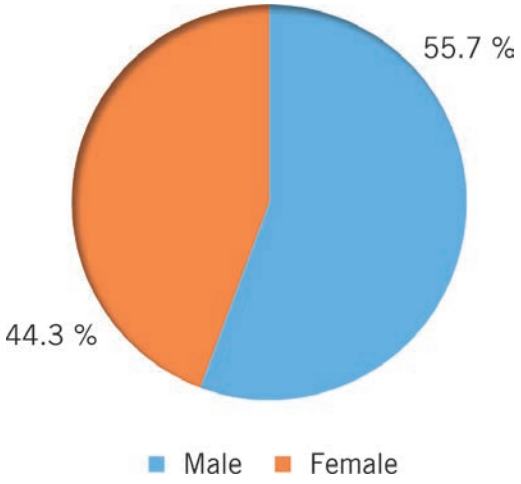
The data on migrant workers that have been used to calculate the estimates refer to migrant workers in the country of destination and measure the migrant stocks in 2013.

Global estimates of the stock of migrants, migrant workers and migrant domestic workers, 2013



Among migrant workers, 83.7 million are men and 66.6 million are women, corresponding to 55.7 per cent and 44.3 per cent of the total respectively.

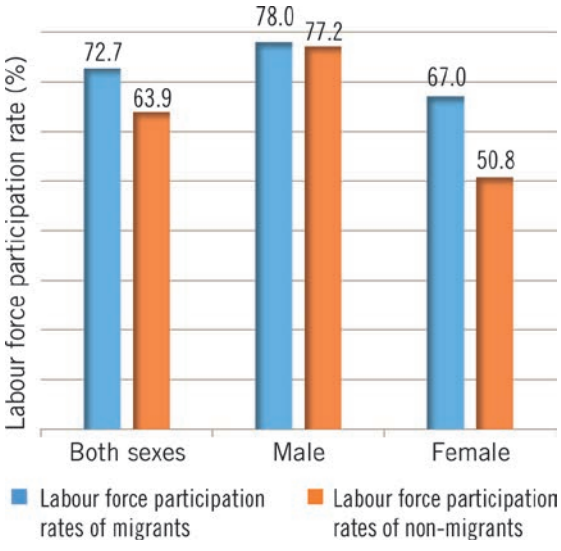
Global distribution of migrant workers, by sex, 2013 (percentages)



Migrants, especially migrant women, have higher labour force participation rates than non-migrants

Migrants form 3.9 per cent of the total global population (aged 15 years and over). However, migrant workers constitute a higher proportion (4.4 per cent) of all workers. This reflects a higher labour force participation rate of migrants (72.7 per cent), compared to that of non-migrants (63.9 per cent). This difference is associated

Global labour force participation rates of migrants and non-migrants, by sex, 2013



with the fact that more migrant women than non-migrant women work (67.0 per cent versus 50.8 per cent), while there is practically no difference between migrant and non-migrant men in respect of their labour force participation rate (78.0 per cent versus 77.2 per cent).

Labour migration is a phenomenon that concerns all regions of the world

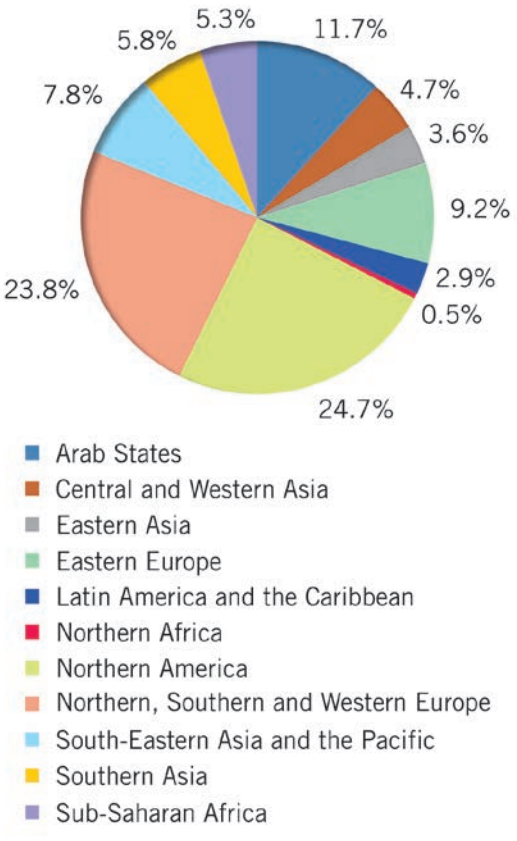
Almost half (48.5 per cent) of migrant workers are concentrated in two broad subregions, Northern America and Northern, Southern and Western Europe. These subregions together make up 52.9 per cent of all female migrant workers and 45.1 per cent of all male migrant workers.

In the Arab States, by contrast, the gender difference is reversed. While the region accounts for 11.7 per cent of all migrant workers, this corresponds to 17.9 per of all male migrant workers and only 4.0 per cent of all female migrant workers.

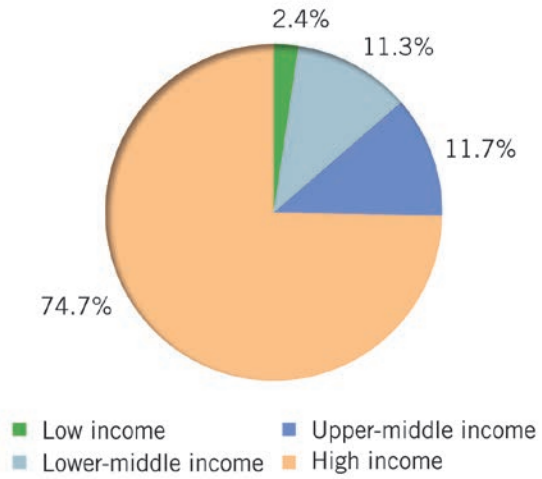
These subregions are followed by Eastern Europe (9.2 per cent) and South Eastern Asia and the Pacific (7.8 per cent).

If each subregion is analysed individually, the Arab States have the highest proportion of migrant workers as a share of all workers, at 35.6 per cent. The corresponding proportions are 20.2 per cent in Northern America and 16.4 per cent in Northern, Southern and Western Europe, followed by Central and Western Asia (10.0 per cent) and Eastern Europe (9.2 per cent). By contrast, in a number of subregions, the proportion of migrant workers is below 2 per cent. The lowest share, at 0.6 per cent, is in Eastern Asia (which includes China), followed by Northern Africa, Southern Asia (which includes India), and Latin America and the Caribbean, all within the range of 1.0–1.5 per cent.

Distribution of migrant workers, by broad subregion, totals (male + female), 2013



Migrant workers, by income level of countries, 2013



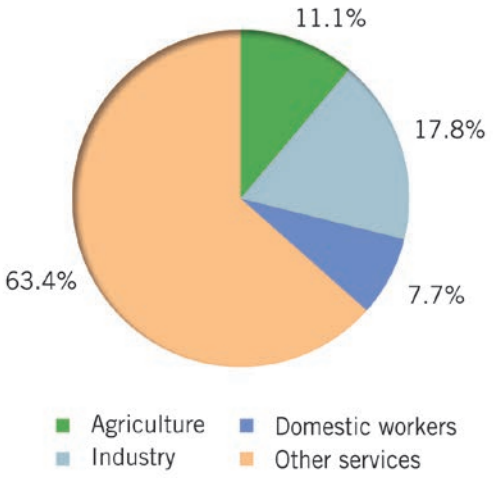
The vast majority of migrant workers are in high-income countries

Of the global total of 150.3 million migrant workers, an estimated 112.3 million (74.7 per cent) were in countries classified as high income, 17.5 million (11.7 per cent) in upper-middle income countries and 16.9 million (11.3 per cent) in lower-middle income countries. The lowest number of migrant workers was in low-income countries, standing at 3.5 million (2.4 per cent).

Migrants are concentrated in certain economic sectors

The data show a concentration of migrants in certain economic sectors, with notable gender differences. The bulk of migrant workers in the world in 2013 were engaged in services, 106.8 million out of a total of 150.3 million, amounting to 71.1 per cent. Industry, including manufacturing and construction, accounted for 26.7 million (17.8 per cent) and agriculture for 16.7 million (11.1 per cent).

Global distribution of migrant workers, by broad branch of economic activity, 2013 (percentages)



Domestic work attracts more than 11 million migrant workers

In 2010, following the adoption of the ILO Convention on Domestic Workers, 2011 (No. 189), the ILO produced the first global and regional estimates on domestic workers. While these estimates did not distinguish between national and migrant domestic workers, the new estimates do make such a distinction.

According to the current estimates, there are 67.1 million domestic workers in the world, of whom 11.5 million are international migrants. This represents 17.2 per cent of all domestic workers and 7.7 per cent of all migrant workers worldwide. In other words, almost every sixth domestic worker in the world was an international migrant in 2013.

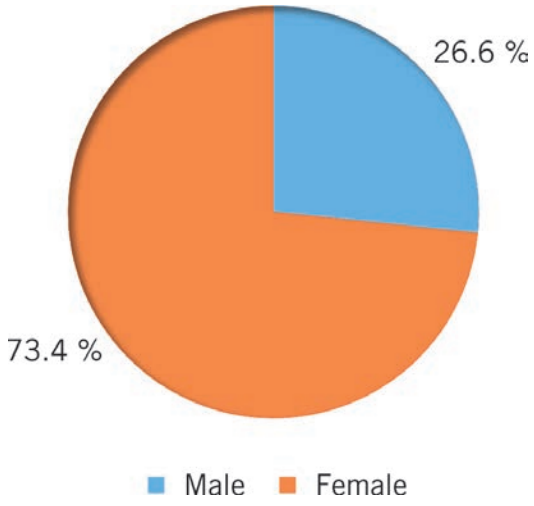
These estimates are an important contribution to the ILO's ongoing efforts to make decent work a reality for all domestic workers worldwide, including migrant domestic workers, who have specific needs and face distinct vulnerabilities.

Most migrant domestic workers are women

About 73.4 per cent (or around 8.5 million) of all migrant domestic workers are women. South-Eastern Asia and the Pacific hosts the largest share, with 24.0 per cent of the world's female migrant domestic workers, followed by Northern, Southern and Western Europe, with 22.1 per cent of the total, and the Arab States with 19.0.

Male migrant workers are much less likely to be domestic workers, with noteworthy regional differences.

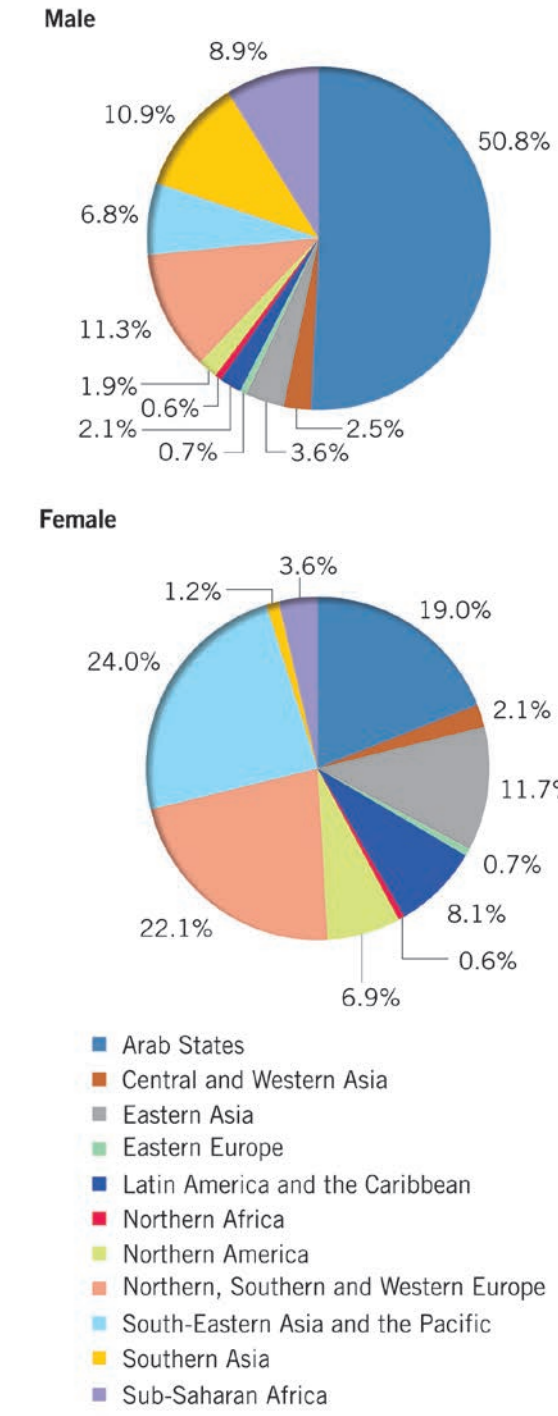
Global distribution of migrant domestic workers, by sex, 2013 (percentages)



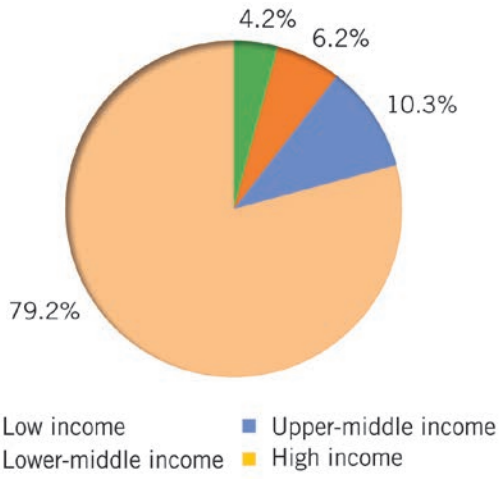
Half of the world's male migrant domestic workers are in the Arab States

The Arab States host 50.8 per cent of all male migrant domestic workers. Over one in ten male migrant workers is a domestic worker. This figure exceeds 5 per cent of the total only in Sub-Saharan Africa and Southern Asia.

Distribution of migrant domestic workers, by sex and broad subregion, 2013 (percentages)



Migrant domestic workers, by income level of countries, totals (male + female), 2013 (percentages)



A very large proportion of migrant domestic workers are concentrated in high-income countries

High-income countries accounted for 9.1 million of the estimated 11.5 million migrant domestic workers globally, amounting to nearly 80 per cent of the total.

Labour migration is rising globally, requiring new and better data

The new global estimates show the magnitude of labour migration in different regions and sectors. It is hoped that they will contribute to a better understanding of the interrelations between migration, labour market policies and the future of work more generally.

As migration patterns and dynamics grow in complexity, high-quality, up-to-date and comparable labour migration statistics are critical for well-informed policy decisions that will maximize the development gains for countries of origin and destination, as well as for the migrants themselves, in line with the 2030 Sustainable Development Agenda.

1. Introduction

The ILO plan of action for migrant workers (2004) called for the development of a global knowledge base on international labour migration, including "cooperation and exchange among countries to improve migration statistics, particularly by expansion of the ILO's International Labour Migration Database" (para. 33). Similarly, the ILO Tripartite Technical Meeting on Labour Migration (2013) has urged for more "evidence-based, policy-oriented research and data development on how workers' rights, wages and other working and living conditions impact on development outcomes for migrant workers and countries of origin and destination" (ILO, 2013a, p. 29, para. 3 (v)). Further appeals for the development of data on labour migration have been made in the ILO Multilateral Framework on Labour Migration (2006) and the Declaration of the UN High-level Dialogue on International Migration and Development (2013). At the 19th International Conference of Labour Statisticians (2013), a resolution was adopted recommending that the ILO "(a) set up a working group with the aim of sharing good practices, discussing and developing a work plan for defining international standards on labour migration statistics that can inform labour market and migration policy, (b) prepare a progress report for discussion to the next ICLS" (ILO, 2013b, p. 68, Resolution IV).

In parallel, following the adoption of the ILO Convention on Domestic Workers, 2011 (No. 189), the ILO produced global and regional estimates on domestic workers revealing for the first time the magnitude of the sector globally (ILO, 2013c). Recognizing that in a number of regions and countries across the world, domestic work is disproportionally conducted by migrant labour and that migrants tend to be more exposed than nationals to the risk of exploitation and abuse because of their migrant status, the ILO has begun a series of initiatives aimed at better understanding the link between migration and domestic work and addressing the specific needs and vulnerabilities of migrant domestic workers. Specifically, a Global Action Programme on Migrant Domestic Workers was launched in 2013 which included the development of survey methodologies to collect data at the national level on domestic workers and their working and living conditions, and in particular on their migrant status. However, information on the overall extent of the phenomenon and the relative importance of migration for domestic work globally and regionally remained unavailable.

To improve national data collection on labour migration and on domestic workers, the ILO has decided to start with the preparation of global and regional estimates of migrant workers and migrant domestic workers based on current methodologies and existing national and international data. A main purpose of global estimation is to provide information on the order of magnitude of labour migration and migrant domestic workers, and draw attention to the economic and social issues involved. Another purpose is to learn about the nature of the available data and the national procedures used for collecting them. The experience should help the development of sound international statistical standards in the future.

However, challenges of data collection and analysis in this field remain multiple; they relate to a variety of factors ranging from the statistical definitions to the weak capacities of authorities responsible. Part of the challenge in analysing migration flows is that there is no global consensus on who is a migrant worker. Household-based surveys may collect this information in different ways and based on varying definitions. ILO work in this area will contribute to building consensus around statistical definitions and methods with a view to improving

information sharing and consistency in labour market and migration policy. This work will support the successful implementation of the 2030 Sustainable Development Agenda adopted by the United Nations, which includes a target on the protection of migrant workers under the goal of promoting decent work and economic growth.

Constructing appropriate policy responses in the field of migration requires a good understanding of the real and changing nature of the phenomenon today, including its drivers, its magnitude and its main characteristics.

The significance and changing patterns of labour mobility today, including female participation in it, requires new thinking and new approaches to governance: a fair sharing of the prosperity migrant workers help to create, and policies that respond equitably to the interests of countries of origin and destination, migrant workers, employers and nationals.

The report is organized in two main parts: Part I on main results, and Part II on the estimate methodology.

In Part I, section 2 on main results presents global and regional estimates of migrant workers disaggregated by sex and broad branch of economic activity, as well as the corresponding global and regional estimates of domestic workers and migrant domestic workers by sex. The reference year for all estimates is 2013. Section 3 provides a short overview of the scope and definitions used.

Part II is divided into three sections, describing the statistical methodology followed. The methodology can be divided into two fairly distinct phases. Phase 1 is the concern of section 4, which describes the international and national data sources used for the global and regional estimates, and the structure of the input data obtained from them. Section 5 discusses issues concerning data quality. Phase 2 of the methodology – procedures for data imputation and production of global and regional estimates – is described in section 6.

Six annexes complement the material presented in the main body of the report.

An initial version of this report was discussed at a validation meeting at the ILO on 18 June 2015. The next version of 27 August 2015 took into account the comments of the meeting, in particular the requirement for a more detailed description of the methodology and its underlying assumptions; explicit imputation for the countries with missing data; and revision of the country groupings in line with the provisional "ILO country groupings to be used for data aggregation and dissemination purposes and a new mechanism for disseminating global and regional estimates of ILO labour market data" (ILO, 2014).

The current version implements more uniform procedures for imputation of missing data and construction of the final estimates, with strong emphasis on transparency, replicability and "institutionalization" of the methodology in future applications.

PART I
MAIN RESULTS

2. Global and regional estimates

Global and regional estimates of the number of migrant workers and migrant domestic workers for 2013 have been constructed by the ILO and an overview of the main results is presented in this section, highlighting the key global and regional figures disaggregated by sex and also by main sector of economic activity.[1] Information on the scope and definitions used for the estimates is described in section 3.

2.1 Global estimates

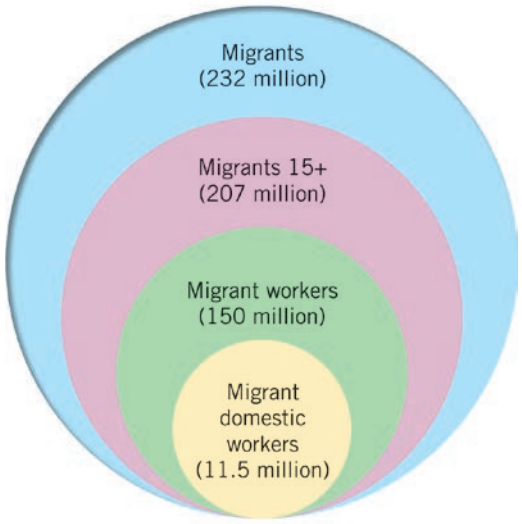
2.1.1 Overall picture

It has been estimated that there were 232 million international migrants in the world in 2013. According to the results presented here, 207 million of them were of working age, 15 years old and over. They are referred throughout this report as the "aged 15+" group. Of these migrants, 150 million were working or economically active. As regards the estimated 67 million domestic workers in the world in 2013, over 11 million are estimated to be international migrants (figure 2.1).

The ILO has published global and regional estimates of domestic workers with 2010 as the reference year. The definition of domestic worker in those earlier estimates is similar to that adopted in the present study. The two estimates are compared in Annex F. The results show a considerably higher estimate of the number of domestic workers in 2013 relative to the 2010 estimate: 67 million for 2013 compared to a little under 53 million in 2010, which is an increase of over 25 per cent. A number of factors have contributed to this increase, as summarized in box 1 in section 5.1 below, and further elaborated in Annex F. Contributing factors include availability of improved data for the 2013 estimates and the use of more precise methodology, subject to less bias of underestimation.

FIGURE **2.1**

Global estimates of the stock of migrants, migrant workers and migrant domestic workers, 2013



2.1.2 Gender differences

There were more males than females among migrants of working age (107.2 million versus 99.3 million). Differences by sex were more marked among migrant workers: 83.7 million male migrant workers versus 66.6 million female migrant workers (table 2.1). This is because male migrants, already more numerous than

1 The estimate figures have been rounded, which could lead to small differences when summing the totals. All data on migrants refer to the destination country.

FIGURE **2.2**

Global distribution of migrant workers, by sex, 2013 (percentages)

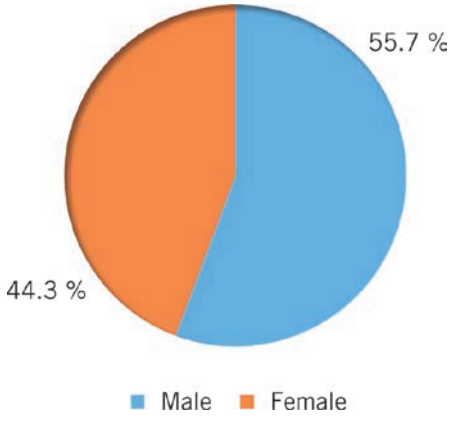
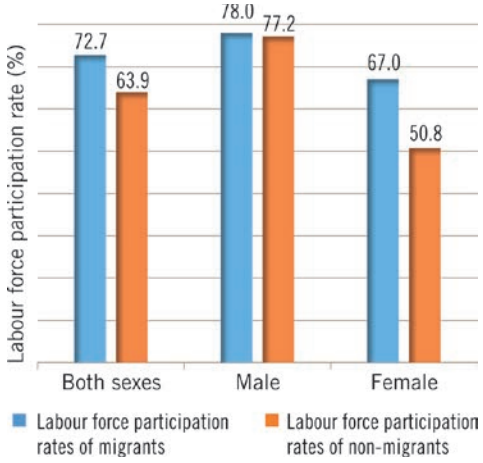


FIGURE **2.3**

Global labour force participation rates of migrants and non-migrants, by sex, 2013



female migrants, also have a higher labour force participation rate (LFPR).

Nevertheless, this difference by sex among migrants is less marked than that among non-migrants. As noted, the difference between the numbers of male and female migrant workers arises from two factors: (a) there are fewer females among migrants; and (b) female migrants have a lower labour force participation rate. Essentially, only the second factor applies in the case of non-migrants, but its effect is stronger than the combined effect of the two factors (a) and (b) for migrants.

Among migrants, 48.1 per cent are female. Females are a lower proportion (44.3 per cent) of migrant workers (figure 2.2), but that is still higher than the corresponding proportion (39.8 per cent) among non-migrant workers.

Migrants form 3.9 per cent of the total population (as noted, all numbers refer to population aged 15 years and over). However, migrant workers constitute a higher proportion (4.4 per cent) of all workers. This of course reflects the higher overall labour force participation rate among migrants (72.7 per cent), compared to that among non-migrants (63.9 per cent); consequently, the proportion of migrant workers in all workers is higher than the proportion of migrants in the total population (figure 2.3).

TABLE **2.1**

Global estimates of migrant workers and migrant domestic workers, 2013 (number of persons aged 15+, in millions)

	Total (male + female)	Male	Female
Total population aged 15+	5 273	2 634	2 639
Migrant population aged 15+	206.6	107.2	99.3
Non-migrant population aged 15+	5 067	2 527	2 540
Total workers	3 390	2 035	1 356
Migrant workers	150.3	83.7	66.6
Non-migrant workers	3 240	1 951	1 289
Total domestic workers	67.1	13.4	53.8
Migrant domestic workers	11.52	3.07	8.45
Non-migrant domestic workers	55.6	10.3	45.3

FIGURE **2.4**

Global distribution of migrant domestic workers, by sex, 2013 (percentages)

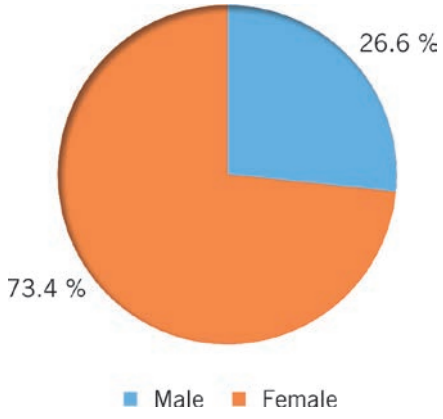
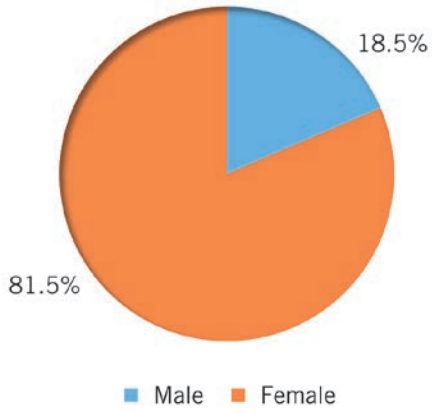


FIGURE **2.5**

Global distribution of non-migrant domestic workers, by sex, 2013 (percentages)



Among 13.4 million male domestic workers, 3.07 million are migrants, while among 53.8 million female domestic workers, over 8.45 million are migrants. Figures 2.4 and 2.5 show the global percentages of migrant and non-migrant domestic workers. Table 2.2 shows the male–female breakdown of the various categories in relative (percentage) terms, while table 2.3 shows various rates computed from these numbers.

The difference between migrants and non-migrants is much sharper when we consider domestic work. As many as 7.7 per cent of migrant workers are domestic workers, compared with only 1.7 per cent of non-migrant workers. Indeed, migrants account for 17.2 per cent of all domestic workers: more than one in every sixth domestic worker in the world was an international migrant in 2013.

Turning to male–female differences in labour force participation and domestic work rates, we find that there is practically no difference in labour force participation rates between migrant and non-migrant men (77 per cent versus 78 per cent). While the rate is lower for migrant women than migrant men (67 per cent versus 78 per cent), it is much higher than that of non-migrant women. The overall difference in migrant and non-migrant rates arises only from the fact that migrant women have a substantially higher labour force participation rate than non-migrant women. This contrasts with men, for whom there is little difference in the overall migrant and non-migrant participation rates.

TABLE **2.2**

Global estimates of migrant workers and migrant domestic workers, by sex, 2013 (percentages)

	Total (male + female)	Male	Female
Total population aged 15+	100	49.9	50.1
Migrant population aged 15+	100	51.9	48.1
Non-migrant population aged 15+	100	49.9	50.1
Total workers	100	60.0	40.0
Migrant workers	100	55.7	44.3
Non-migrant workers	100	60.2	39.8
Total domestic workers	100	19.9	80.1
Migrant domestic workers	100	26.6	73.4
Non-migrant domestic workers	100	18.5	81.5

TABLE **2.3**

Migrant workers and migrant domestic workers, ratios and labour force participation rates, by sex, 2013 (percentages)

	Total (male + female)	Male	Female
Migrants as a proportion of population aged 15+	3.9	4.1	3.8
Migrant workers as a proportion of all workers	4.4	4.1	4.9
Labour force participation rate for total population	64.3	77.2	51.4
Labour force participation rate for migrant population	72.7	78.0	67.0
Labour force participation rate for non-migrant population	63.9	77.2	50.8
Domestic workers as a proportion of workers in total population	2.0	0.7	4.0
Migrant domestic workers as a proportion of all migrant workers	7.7	3.7	12.7
Domestic workers as a proportion of workers, in non-migrant population	1.7	0.5	3.5
Migrant domestic workers as a proportion of all domestic workers	17.2	22.9	15.7

TABLE **2.4**

Global distribution of migrant workers, by broad branch of economic activity and by sex, 2013

	Numbers of workers (in millions)			Percentage distribution by sector				
	Agriculture	Industry	Services	Agriculture	Industry	Services		MD/MW
Total	16.7	26.7	106.8	11.1	17.8	71.1	100.0	7.7
Male	9.3	16.6	57.8	11.2	19.8	69.1	100.0	3.7
Female	7.4	10.2	49.0	11.1	15.3	73.7	100.0	12.7

Note: MD/MW = Migrant domestic workers as a proportion of all migrant workers.

Over 80 per cent of non-migrant domestic workers are female. Among migrant domestic workers, the proportion of women is lower, at 73.4 per cent. However, if we look at the proportion of of migrants among domestic workers by sex, the share is higher among men (22.9 per cent) than it is among women (15.7 per cent), as shown in table 2.3. In other words, one in every four to five male domestic workers in the world in 2013 was an international migrant, while under one in every six female domestic workers was an international migrant. This is notwithstanding the fact that domestic work forms a much higher proportion of all work among migrants compared to non-migrants, and that women workers are six times more likely to be in domestic work compared to male workers.

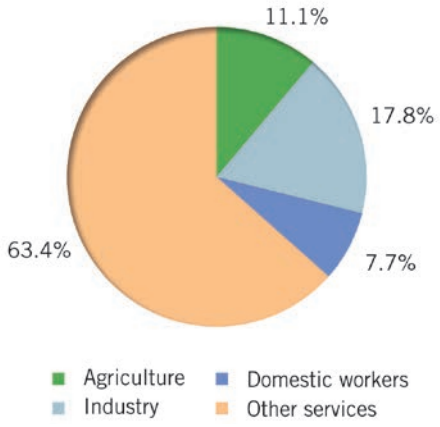
2.1.3 Distribution of migrant workers by broad branch of economic activity

As shown in table 2.4, most migrant workers in the world in 2013 were engaged in services: 106.8 million out of a total of 150.3 million migrant workers, amounting to 71.1 per cent. Industry, including manufacturing and construction, accounted for 26.7 million (17.8 per cent) and agriculture for 16.7 million (11.1 per cent). Among the 71.1 per cent of migrant workers who are in the service sector, about 7.7 per cent worked as domestic workers and the remaining 63.4 per cent in other services (figure 2.6).

It is interesting to note male–female differences in the distribution of migrant workers by sector. For both sexes, agriculture accounts for almost exactly the same proportion (around 11 per cent). Men are more often engaged in industry than women (19.8 per cent versus 15.3 per cent), and less in the service sector (69.1 per

FIGURE **2.6**

Global distribution of migrant workers, by broad branch of economic activity, 2013 (percentages)



cent versus 73.7 per cent). However, this difference in relation to the service sector is more than accounted for by markedly more engagement of women in domestic work. There are in fact, in relative terms, a higher proportion of male migrant workers engaged in services other than domestic work compared to female migrant workers (65.4 per cent of men versus 61.0 per cent of women).

2.2 Estimates by country income group

2.2.1 Overall patterns

Table 2.5 shows the four groups into which countries have been classified by income level (see Annex A). The groups differ considerably in size, as can be seen from the size of their total labour force. The high income group of countries accounts for 20.3 per cent and the low income group for 7.7 per cent of the world labour force. The middle income groups are much larger: the upper-middle income group accounts for 38.1 per cent and the lower-middle income group for 33.9 per cent of the total labour force. The former group includes China (65.9 per cent of the group's labour force); the latter group includes India and Indonesia (together accounting for 53.3 per cent).

When countries are grouped by income level, the preliminary results show that the vast majority of migrant workers were in high-income countries in 2013 (figure 2.7).

According to the data shown in table 2.5, out of the world total of 150.3 million migrant workers, an estimated

TABLE **2.5**

Migrant workers and migrant domestic workers, by income level of countries, total (male + female), 2013

	Low income	Lower-middle income	Upper-middle income	High income	All M+F
Total workers ('000)	260.2	1150.4	1293	686.6	3390.2
Total workers in %	7.7	33.9	38.1	20.3	100
Labour force participation rate for total population	77.5	59.7	68.7	60.8	64.3
Migrant population aged 15+ ('000)	6.0	24.3	24.8	151.5	206.6
Migrants as a proportion of population aged 15+	1.8	1.3	1.3	13.4	3.9
Migrant workers ('000)	3.5	16.9	17.5	112.3	150.3
Migrant workers in %	2.4	11.3	11.7	74.7	100
Labour force participation rate for migrant population	59.4	69.7	70.7	74.1	72.7
Migrant workers as a proportion of all workers	1.4	1.5	1.4	16.3	4.4
Total domestic workers ('000)	4.7	16.4	32.2	13.9	67.1
Migrant domestic workers ('000)	0.49	0.72	1.19	9.13	11.52
Migrant domestic workers in %	4.2	6.2	10.3	79.2	100
Migrant domestic workers as a proportion of all migrant workers	13.8	4.2	6.8	8.1	7.7
Migrant domestic workers as a proportion of all domestic workers	10.5	4.4	3.7	65.8	17.2

Note: Numbers in millions for the following categories: total workers, migrant population aged 15+, migrant workers, domestic workers and migrant domestic workers.

FIGURE **2.7**

Migrant workers, by income level of countries, total (male + female), 2013 (percentages)

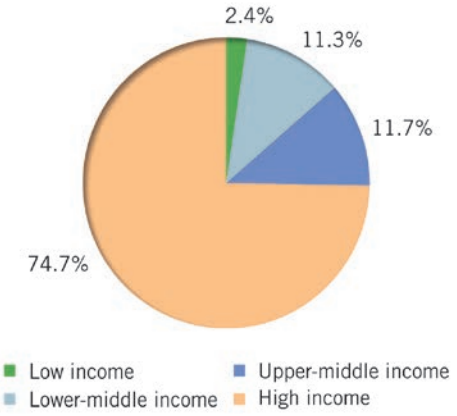
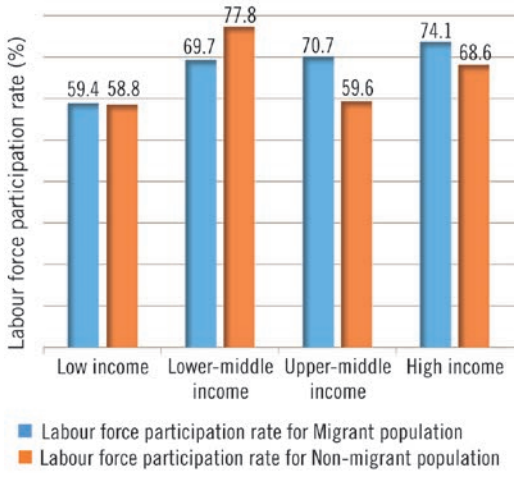


FIGURE **2.8**

Labour force participation rates of migrants and non-migrants, by income level of countries, 2013



112.3 million (74.7 per cent) migrant workers were in countries classified as high income. The estimated number of migrant workers in upper-middle income countries was 17.5 million (11.7 per cent), and in countries classified as lower-middle income 16.9 million (11.3 per cent). The lowest numbers of migrant workers were in low-income countries at 3.5 million (2.4 per cent).

Table 2.5 also shows the estimated numbers and distribution of migrants (as distinct from migrant workers). The picture is of course very similar, except for some effect of the lower labour force participation rate among migrants in the low-income countries.

A more telling picture is provided by the variation in the proportion of migrant workers in the total (migrant and non-migrant) workforce. One in six workers in high-income countries is a migrant. In all other groups, the proportions are very low and very similar, between 1.4 per cent and 1.5 per cent of the total workforce. There is no difference by income level, with the exception of the high income group.

The labour force participation rate of the population as a whole is low, at around 60.8 per cent in high income and lower-middle income groups. It is much higher (near 68.7 per cent) in the upper-middle income group, and highest (77.5 per cent) in the low income group. As noted above, the upper-middle income group includes China with a relatively high labour force participation rate, and the lower-middle income group includes India with a relatively low labour force participation rate, in particular among women.

The picture for migrants shown in table 2.5 is rather different. The labour force participation rate of migrants declines with country income levels: from around 74.1 per cent in the high income group, to around 70.7 per cent in upper- and lower-middle group countries, and to 59.4 per cent in the low income group.

As a result, the labour force participation of migrants is considerably higher than non-migrants in high-income countries, and higher in upper-middle income countries as well. By contrast, the rate for migrants is much lower than that for non-migrants in lower-middle income countries. In low-income countries, participation rates for migrants are practically identical to those of non-migrants (figure 2.8).

The above pattern of variation according to level of income of the migration-receiving country deserves further investigation. It is plausible that migration to richer countries is more likely to be linked to work, while migration to poorer countries more often involves dependants. As for labour force participation rates of non-migrants, they are high in low-income countries, and also in upper-middle income countries. The non-migrant labour force participation rates are lower in high-income and also in lower-middle income countries, in both cases largely as a result of low participation rates among women.

An even larger proportion of migrant domestic workers (nearly 79.2 per cent) than migrant workers in general are concentrated in the high income group of countries (figure 2.9). Indeed, this country grouping accounts for

FIGURE **2.9**

Migrant domestic workers, by income level of countries, 2013 (percentages)

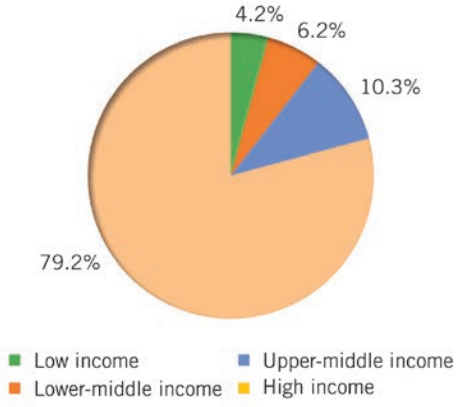
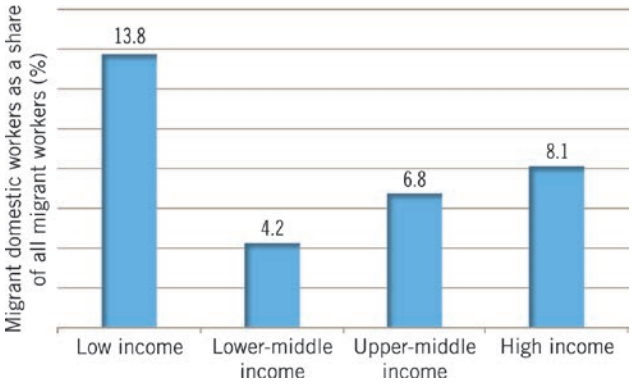


FIGURE **2.10**

Migrant domestic workers as a share of all migrant workers, by income level of countries, 2013



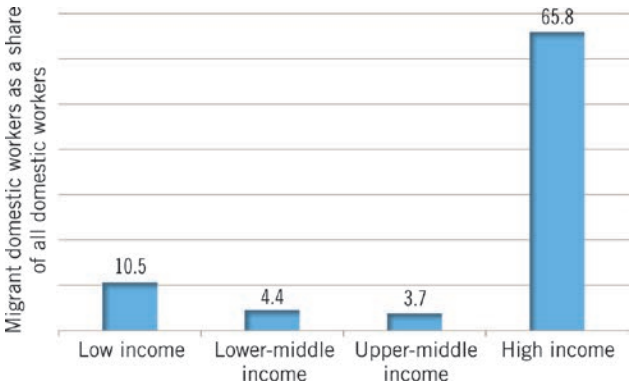
9.1 million of the estimated 11.5 million migrant domestic workers globally. Also, unlike migrant workers as a whole, there is a clear gradient in the number of migrant domestic workers according to countries' income level. The shares are: 10.3 per cent in the upper-middle income group; 6.2 per cent in the lower-middle income group; and 4.2 per cent in the low income group.

The share of migrant domestic workers among all migrant workers has an interesting pattern. It is similar, at 7 per cent and 8 per cent, in the high and upper-middle income groups respectively, lower (4.2 per cent) in the lower-middle income group, but the highest (13.8 per cent) in the low income group. One in seven migrant workers in low-income countries is a domestic worker (figure 2.10).

In high-income countries two-thirds (65.8 per cent) of all domestic workers are migrants (figure 2.11). The proportion is low (10.5 per cent) in low-income countries, but very low (around 4 per cent) in upper-middle and lower-middle income groups. These latter groups include very large countries such as China and India, where internal rather than international migration prevails.

FIGURE **2.11**

Migrant domestic workers as a share of all domestic workers, by income level of countries, 2013



2.2.2 Gender differentials

The pattern by sex, as shown in figure 2.12 and table 2.6, is of course similar in certain respects to the overall pattern. However, there are some noteworthy differences.

Among the general population, female labour force participation rates fall short of male rates by large margins, but by amounts varying greatly according to income group. Female participation rates are lower by 11.4 percentage points in low-income countries, by around 16.8 percentage points in high-income countries, by around 19.6 percentage points in upper-middle income countries, but by a huge margin of 39.9 percentage points in lower-middle income countries. The low female participation rate in the last-mentioned

TABLE **2.6**

Migrant workers and migrant domestic workers, by sex and income level of countries, 2013

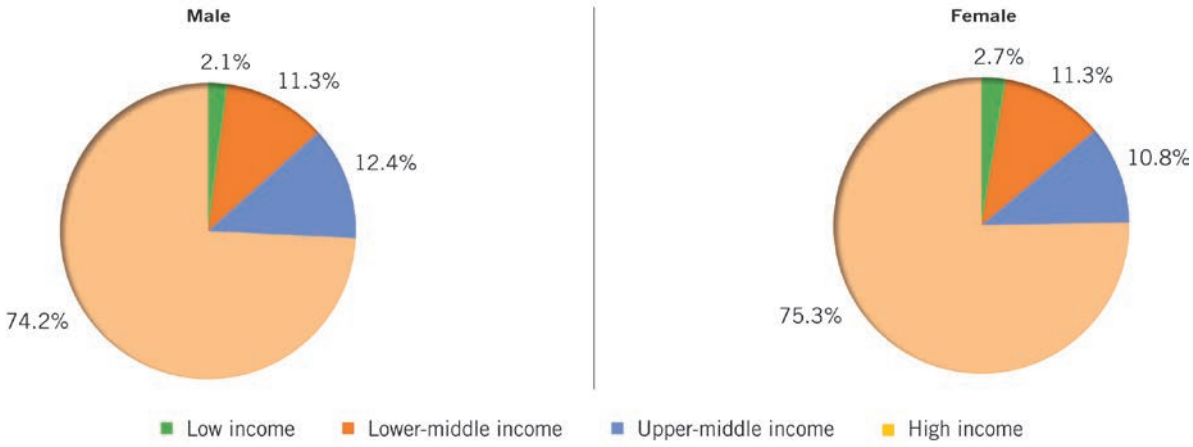
Male	**Income level**				
	Low income	**Lower-middle income**	**Upper-middle income**	**High income**	**Total Male**
Total workers ('000)	137.5	772.0	742.7	382.3	2 034.6
Total workers in %	6.8	37.9	36.5	18.8	100
Labour force participation rate for total population	83.3	79.5	78.4	69.4	77.2
Migrant population aged 15+ ('000)	2.9	12.8	13.3	78.3	107.2
Migrants as a proportion of population aged 15+	1.8	1.3	1.4	14.2	4.1
Migrant workers ('000)	1.8	9.4	10.4	62.1	83.7
Migrant workers in %	2.1	11.3	12.4	74.2	100
Labour force participation rate for migrant population	61.2	73.5	78.1	79.4	78.0
Migrant workers as a proportion of all workers	1.3	1.2	1.4	16.3	4.1
Total domestic workers ('000)	1.2	4.5	4.3	3.5	13.4
Migrant domestic workers ('000)	0.25	0.42	0.21	2.2	3.07
Migrant domestic workers in %	8.1	13.6	6.7	71.6	100
Migrant domestic workers as a proportion of all migrant workers	14.1	4.4	2.0	3.5	3.7
Migrant domestic workers as a proportion of all domestic workers	21	9.4	4.8	63.2	22.9

Female	**Income level**				
	Low income	**Lower-middle income**	**Upper-middle income**	**High income**	**Total Male**
Total workers ('000)	122.7	378.4	550.3	304.3	1 355.7
Total workers in %	9.1	27.9	40.6	22.4	100
Labour force participation rate for total population	71.9	39.6	58.8	52.6	51.4
Migrant population aged 15+ ('000)	3.1	11.5	11.5	73.2	99.3
Migrants as a proportion of population aged 15+	1.8	1.2	1.2	12.7	3.8
Migrant workers ('000)	1.8	7.5	7.2	50.1	66.6
Migrant workers in %	2.7	11.3	10.8	75.3	100
Labour force participation rate for migrant population	57.7	65.3	62.2	68.4	67
Migrant workers as a proportion of all workers	1.5	2.0	1.3	16.5	4.9
Total domestic workers ('000)	3.5	12	27.9	10.4	53.8
Migrant domestic workers ('000)	0.24	0.3	0.98	6.93	8.45
Migrant domestic workers in %	2.8	3.6	11.6	82	100
Migrant domestic workers as a proportion of all migrant workers	13.5	4.0	13.7	13.8	12.7
Migrant domestic workers as a proportion of all domestic workers	6.9	2.5	3.5	66.7	15.7

Note: Numbers in millions for the following categories: total workers, migrant population aged 15+, migrant workers, domestic workers and migrant domestic workers

FIGURE **2.12**

Migrant workers, by sex and income level of countries, 2013 (percentages)



group is the main factor behind the low overall participation rate.

The picture is very different among migrants, as summarized in table 2.7.

Let us first consider gender differences in the labour force participation rate; they are much smaller in the migrant population compared to those in the non-migrant population. As shown in figure 2.13, there is only a small gender differential (3.5 percentage points) in participation rate among migrants in low-income countries. Migrant female participation rates are lower by 11.0 percentage points than migrant male rates in high-income countries, by 8.2 percentage points in lower-middle income countries, but by as much as 15.9 percentage points in upper-middle income countries.

The following picture emerges concerning migrant versus non-migrant labour force participation rates for males and females.

For men, as noted, the overall participation rates for migrants and non-migrants are practically identical (77 per cent and 78 per cent respectively). But this masks very sharp migrant versus non-migrant differentials for males

TABLE **2.7**

Migrants and non-migrants: Labour force participation rate, and proportion of domestic workers among all workers, by sex and income level of countries, 2013

	Labour force participation rate, %						Domestic workers as % of all workers					
	Migrants			Non-migrants			Migrants			Non-migrants		
Income group	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
1 Low income	59.4	61.2	57.7	77.8	83.7	72.1	13.8	14.1	13.5	1.6	0.7	2.7
2 Lower-middle income	69.7	73.5	65.3	59.6	79.6	39.3	4.2	4.4	4.0	1.4	0.5	3.1
3 Upper-middle income	70.7	78.1	62.2	68.6	78.4	58.8	6.8	2.0	13.7	2.4	0.6	5.0
4 High income	74.1	79.4	68.4	58.8	67.8	50.3	8.1	3.5	13.8	0.8	0.4	1.4
Total	72.7	78.0	67.0	63.9	77.2	50.8	7.7	3.7	12.7	1.7	0.5	3.5

FIGURE **2.13**

Labour force participation rates of migrants and non-migrants , by sex and income level of countries, 2013

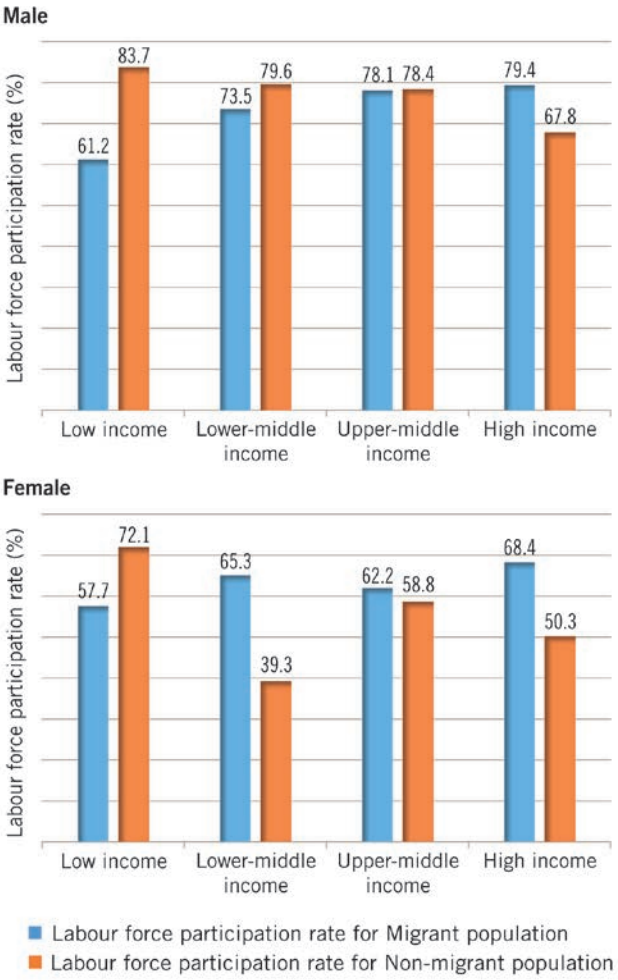
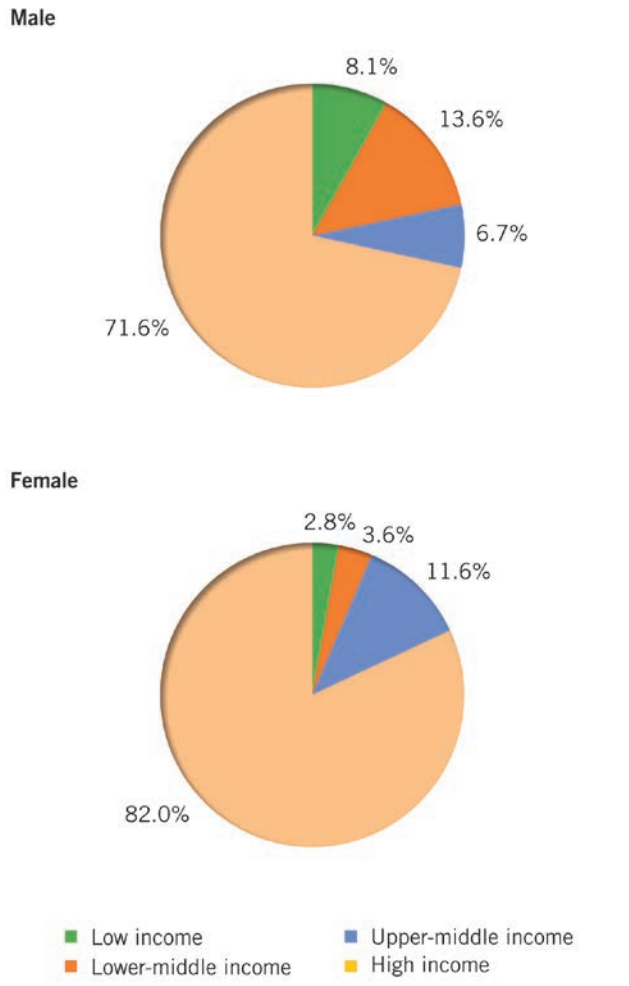


FIGURE **2.14**

Migrant domestic workers, by sex and income level of countries, 2013 (percentages)



within income groups. A similarity between migrant and non-migrant rates is observed only in the upper-middle income group. As income levels decline, the rate of participation goes down for male migrants. The migrant participation rate is lower than that for the total male population by around 6.0 percentage points in lower-middle income countries, reaching 22.1 percentage points in the low income group. By contrast, in the high income group, the rate for male migrants is higher than that for the total male population by 10.0 percentage points.

For women, the overall participation rates of migrants is higher than those of non-migrants, by 15.6 percentage points. But again there are sharp differences in this respect when we consider income groups individually. In upper-middle income countries, the difference between female migrants and non-migrants is small (the rate for migrants being a little under 5.0 percentage points higher), rather similar to the pattern noted above for males in this income group.

The rate for female migrants compared to the total female population is lower by around 14.1 percentage points in the low income group but higher by 15.8 percentage points in the high income group.

The most pronounced contrast is in lower-middle income countries. In this group, the migrant female participation rate is higher than the non-migrant rate by 16.3 percentage points. This is in sharp contrast to the migrant/non-migrant differential noted above for men. While for men, the migrant participation rate is lower than the non-migrant rate in lower-middle income countries, for women it is the other way around and is very marked.

FIGURE **2.15**

Migrant domestic workers as a share of all migrant workers, by sex and income level of countries, 2013

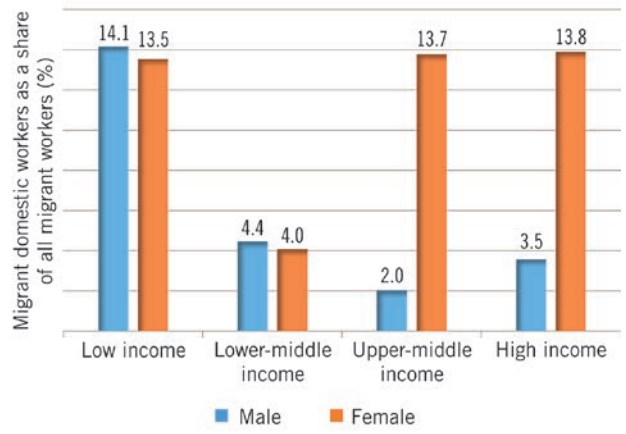
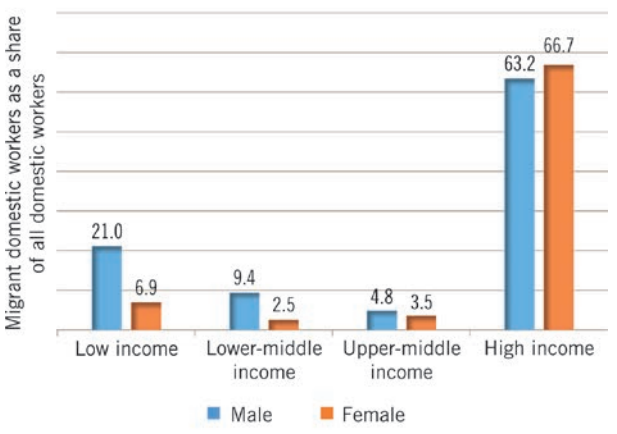


FIGURE **2.16**

Migrant domestic workers as a share of all domestic workers, by sex and income level of countries, 2013



As for migrant domestic workers, as noted, nearly three-quarters of them are female. The pattern by income group for males and females is similar to the overall pattern described above, namely the predominance of the high income group, and a decrease in numbers with declining income level (figure 2.14). There are however some differences in the case of male migrant domestic workers. The main difference is a somewhat reduced predominance of the high income group (accounting for just over 70 per cent rather than over 80 per cent of the total migrant domestic workers), and some preference for male migrant workers in lower-middle income group countries.

There is no gender difference in the share of migrant domestic workers among all migrant workers in low income and lower-middle income countries (figure 2.15). In upper-middle and high income countries, however, a much higher proportion (around 14 per cent, or one in seven, in either group) of female migrant workers are domestic workers, but only 2 per cent and 3 per cent, respectively, in the case of male migrant workers.

The pattern of migrant domestic workers as a share of all domestic workers by income level and by sex (figure 2.16) is quite different from the patterns for migrant domestic workers as a share of migrants.There is no gender difference in the high income group, in which the ratio is around 65 per cent for both males and females. In all other income groups, the ratio is much lower overall, but it is noteworthy that it is three times higher for males than for females.

2.3 Regional estimates

2.3.1 Migrant workers

Table 2.8 shows the 11 broad subregions into which countries have been grouped. The groups differ considerably in size, as can be seen from the the total labour force. Two broad subregions, Eastern Asia (which includes China) and Southern Asia (which includes India) together account for half the global working population. The smallest broad subregion is Arab States. However, this region has a much greater importance in the present context because of the number of migrants and migrant workers it has (figure 2.17).

Two broad subregions, Northern America and Northern, Southern and Western Europe, together account for half (48.5 per cent) of global migrants or migrant workers. The next most important subregion is Arab States which accounts for over a tenth of the world's migrant workers.

As shown in table 2.8, the share of migrant workers among all workers is the highest (35.6 per cent) in Arab States. The corresponding proportion is 20.2 per cent in Northern America and 16.4 per cent in Northern, Southern and Western Europe, followed by Central and Western Asia (10.0 per cent) and Eastern Europe (9.2 per cent).

By contrast, in a number of subregions, the share of migrant workers as a proportion of all workers is below 2 per cent. The lowest, at 0.6 per cent, is Eastern Asia (which includes China); followed by Northern Africa,

Southern Asia (which includes India), and Latin America and the Caribbean, all within the range 1.0–1.5 per cent.

The two broad subregions, Northern America and Northern, Southern and Western Europe, host relatively larger shares of female compared to male migrant workers. These regions together account for 45.1 per cent of all male migrant workers, but for a higher proportion (52.9 per cent) of all female migrant workers (figure 2.18). The picture in Arab States is the opposite: that region accounts for 17.9 per cent of all male migrant workers, but for only 4.0 per cent of all female migrant workers. Table 2.9 shows the breakdown for migrant workers and migrant domestic workers.

The pattern of higher labour force participation among migrants relative to non-migrants (figure 2.19), and larger differences among women than among men observed for the world as a whole (figure 2.20), is also observed in every region except Sub-Saharan Africa, where the labour force participation rate of migrants is below the rate of non-migrants. There is a (negligibly) small difference in the same direction in Latin America and the Caribbean region.

TABLE **2.8**

Migrant workers and migrant domestic workers, by broad subregion, total (male + female), 2013

	Broad subregion											
	Northern Africa	Sub-Saharan Africa	Latin America and the Caribbean	Northern America	Northern, Southern and Western Europe	Eastern Europe	Central and Western Asia	Arab States	Eastern Asia	South-Eastern Asia and the Pacific	Southern Asia	All M+F
Total workers ('000)	70.6	356.8	299.1	183.3	218	149.6	69.9	49.5	962.9	335.3	695.2	3 390.2
Total workers in %	2.1	10.5	8.8	5.4	6.4	4.4	2.1	1.5	28.4	9.9	20.5	100
Labour force participation rate for total population	49.1	70.6	66.5	63.9	57.9	60.0	57.7	51.1	72.0	70.1	56.6	64.3
Migrant population aged 15+ ('000)	1.5	12.6	6.7	50.3	49.1	18.7	9.7	23.2	7.2	15.4	12.2	206.6
Migrants as a proportion of population aged 15+	1.0	2.5	1.5	17.5	13.0	7.5	8.0	24	0.5	3.2	1.0	3.9
Migrant workers ('000)	0.8	7.9	4.3	37.1	35.8	13.8	7.0	17.6	5.4	11.7	8.7	150.3
Migrant workers in %	0.5	5.3	2.9	24.7	23.8	9.2	4.7	11.7	3.6	7.8	5.8	100
Labour force participation rate for migrant population	52.3	63.1	65.0	73.7	72.9	73.9	72.3	76.0	75.2	76.5	71.0	72.7
Labour force participation rate for non-migrant population	49.1	70.8	66.5	61.8	55.6	58.9	56.4	43.3	72.0	69.9	56.4	63.9
Migrant workers as a proportion of all workers	1.1	2.2	1.5	20.2	16.4	9.2	10.0	35.6	0.6	3.5	1.3	4.4
Total domestic workers ('000)	0.9	8.4	17.9	0.9	4.1	0.3	0.8	3.8	14.6	9.1	6.4	67.1
Migrant domestic workers ('000)	0.07	0.58	0.75	0.64	2.21	0.08	0.26	3.16	1.1	2.24	0.44	11.52
Migrant domestic workers in %	0.6	5.0	6.5	5.5	19.2	0.7	2.2	27.4	9.5	19.4	3.8	100
Migrant domestic workers as a proportion of all migrant workers	9.0	7.3	17.2	1.7	6.2	0.6	3.6	17.9	20.4	19.0	5.0	7.7
Migrant domestic workers as a proportion of all domestic workers	7.9	6.9	4.2	70.8	54.6	25.0	32.1	82.7	7.5	24.7	6.9	17.2

Note: Numbers in millions for the following categories: total workers, migrant population aged 15+, migrant workers, domestic workers and migrant domestic workers.

2.3.2 Migrant domestic workers

The distribution of migrant domestic workers by broad subregion is shown in figure 2.21. Male migrant workers are much less likely to be domestic workers than female migrant workers. Still, in the Arab States, over one in ten male migrant workers is a domestic worker. Among the other regions, this figure exceeds 5 per cent only in Sub-Saharan Africa and Southern Asia.

Looking at the distribution of male migrant domestic workers over regions (figure 2.22), we see that the position of Arab States is very dominant: over half (50.8 per cent) of all male migrant domestic workers in the world are in the Arab States.

It is interesting to note the contrast with some other regions. The South-Eastern Asia and the Pacific region accounts for a small proportion (6.8 per cent) of all male migrant domestic workers, but for a much larger proportion (24.0 per cent, i.e. one in four) of all female migrant domestic workers. Similarly, the Northern, Southern and Western Europe region accounts for 11.3 per cent of all male migrant domestic workers, but for 22.1 per cent of all female migrant domestic workers in the world. This indicates a strong preference for female as opposed to

FIGURE **2.17**

Distribution of migrant workers, by broad subregion, total (male + female), 2013 (percentages)

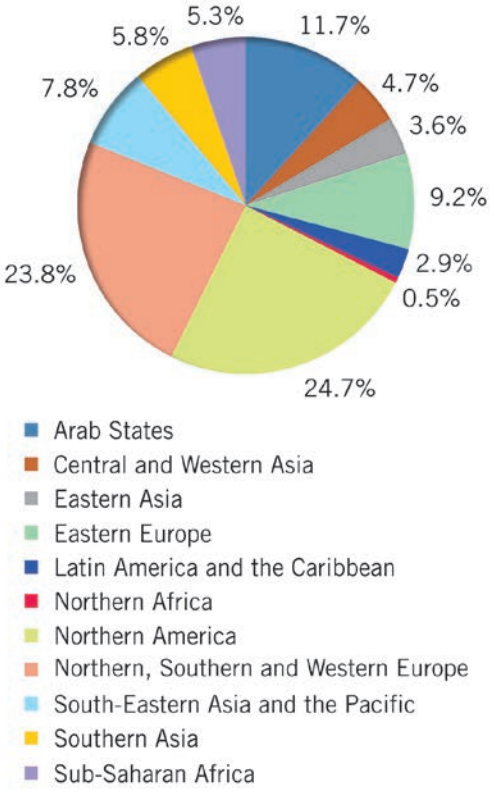


FIGURE **2.18**

Distribution of migrant workers, by sex and broad subregion, 2013 (percentages)

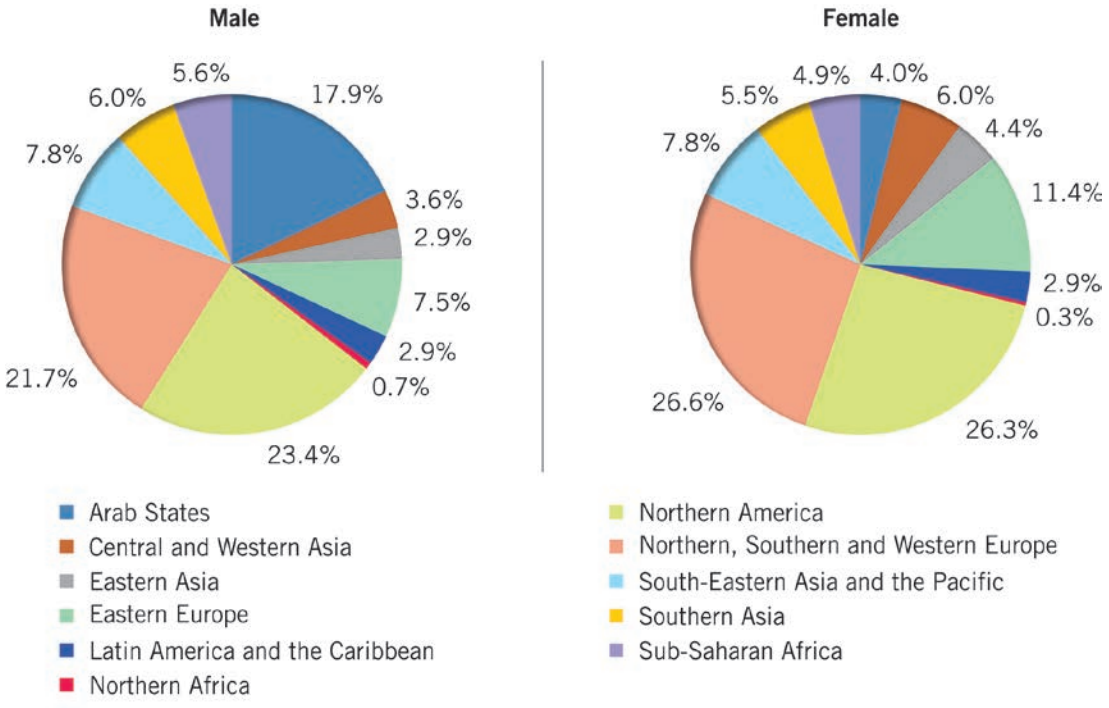


TABLE **2.9**

Migrant workers and migrant domestic workers, by sex and broad subregion, 2013

	Broad subregion											
Male	Northern Africa	Sub-Saharan Africa	Latin America and the Caribbean	Northern America	Northern, Southern and Western Europe	Eastern Europe	Central and Western Asia	Arab States	Eastern Asia	South-Eastern Asia and the Pacific	Southern Asia	All M+F
Total workers ('000)	53.0	191.6	174	98.2	119.4	78.0	43.1	40.7	537.2	191.5	507.8	2034.6
Total workers in %	2.6	9.4	8.6	4.8	5.9	3.8	2.1	2.0	26.4	9.4	25.0	100
Labour force participation rate for total population	74.3	76.6	79.7	70.1	65.3	67.9	73.2	75.4	78.9	81.4	81	77.2
Migrant population aged 15+ ('000)	0.9	6.9	3.2	24.5	23.6	8.9	4.6	16.7	3.3	7.8	6.9	107.2
Migrants as a proportion of population aged 15+	1.3	2.7	1.5	17.5	12.9	7.7	7.9	31.0	0.5	3.3	1.1	4.1
Migrant workers ('000)	0.6	4.7	2.4	19.6	18.1	6.3	3.0	15.0	2.5	6.6	5.0	83.7
Migrant workers in %	0.7	5.6	2.9	23.4	21.7	7.5	3.6	17.9	2.9	7.8	6.0	100
Labour force participation rate for migrant population	61.8	68.1	75.1	79.9	77.0	70.3	65.9	89.7	75.3	84.2	72.7	78.0
Labour force participation rate for non-migrant population	74.4	76.8	79.8	68.1	63.5	67.7	73.8	69	78.9	81.3	81.1	77.2
Migrant workers as a proportion of all workers	1.0	2.4	1.4	20.0	15.2	8.0	7.1	36.8	0.5	3.4	1.0	4.1
Total domestic workers ('000)	0.4	2.1	2.2	0.1	1.2	0.1	0.3	1.6	1.7	1.5	2.2	13.4
Migrant domestic workers ('000)	0.02	0.27	0.06	0.06	0.35	0.02	0.08	1.56	0.11	0.21	0.34	3.07
Migrant domestic workers in %	0.6	8.9	2.1	1.9	11.3	0.7	2.5	50.8	3.6	6.8	10.9	100
Migrant domestic workers as a proportion of all migrant workers	3.5	5.8	2.6	0.3	1.9	0.3	2.5	10.4	4.5	3.2	6.7	3.7
Migrant domestic workers as a proportion of all domestic workers	5.3	13	2.8	68.3	28.4	30.3	29.3	95.7	6.6	13.8	14.9	22.9
Female												
Total workers ('000)	17.6	165.2	125.2	85.0	98.7	71.6	26.9	8.8	425.7	143.7	187.4	1355.7
Total workers in %	1.3	12.2	9.2	6.3	7.3	5.3	2.0	0.6	31.4	10.6	13.8	100
Labour force participation rate for total population	24.2	64.8	54.1	57.9	50.9	53.3	43	20.5	64.9	59.1	31.2	51.4
Migrant population aged 15+ ('000)	0.6	5.7	3.5	25.8	25.5	9.8	5.1	6.5	3.9	7.6	5.3	99.3
Migrants as a proportion of population aged 15+	0.8	2.2	1.5	17.6	13.2	7.3	8.1	15.1	0.6	3.1	0.9	3.8
Migrant workers ('000)	0.2	3.3	1.9	17.5	17.7	7.6	4.0	2.6	2.9	5.2	3.7	66.6
Migrant workers in %	0.3	4.9	2.9	26.3	26.6	11.4	6.0	4.0	4.4	7.8	5.5	100
Labour force participation rate for migrant population	37.6	57.1	55.7	67.8	69.2	77.2	78.1	40.7	75.0	68.4	68.8	67.0
Labour force participation rate for non-migrant population	24.1	64.9	54	55.8	48.1	51.4	39.9	16.9	64.9	58.8	30.8	50.8
Migrant workers as a proportion of all workers	1.2	2.0	1.6	20.6	17.9	10.6	14.8	30.0	0.7	3.6	2.0	4.9
Total domestic workers ('000)	0.5	6.3	15.7	0.8	2.8	0.3	0.5	2.2	12.9	7.5	4.1	53.8
Migrant domestic workers ('000)	0.05	0.31	0.69	0.58	1.87	0.06	0.18	1.6	0.99	2.03	0.1	8.45
Migrant domestic workers in %	0.6	3.6	8.1	6.9	22.1	0.7	2.1	19.0	11.7	24.0	1.2	100.0
Migrant domestic workers as a proportion of all migrant workers	23.0	9.4	35.3	3.3	10.6	0.8	4.5	60.8	33.9	39.2	2.8	12.7
Migrant domestic workers as a proportion of all domestic workers	9.8	4.9	4.4	71.0	65.8	23.6	33.4	73.1	7.6	26.9	2.5	15.7

Note: Numbers in millions for the following categories: total workers, migrant population aged 15+, migrant workers, domestic workers and migrant domestic workers.

male migrant domestic workers in the above-mentioned regions.

Migrant domestic workers make up a large proportion (between 17 per cent and 20 per cent) of all migrant workers in four regions: Eastern Asia, South-Eastern Asia and the Pacific, Arab States, and Latin America and the Caribbean (figure 2.23). In another four regions (Northern America, Sub-Saharan Africa, Southern Asia, and Northern, Southern and Western Europe), their shares are between

FIGURE **2.19**

Labour force participation rates of migrants and non-migrants, by broad subregion, 2013

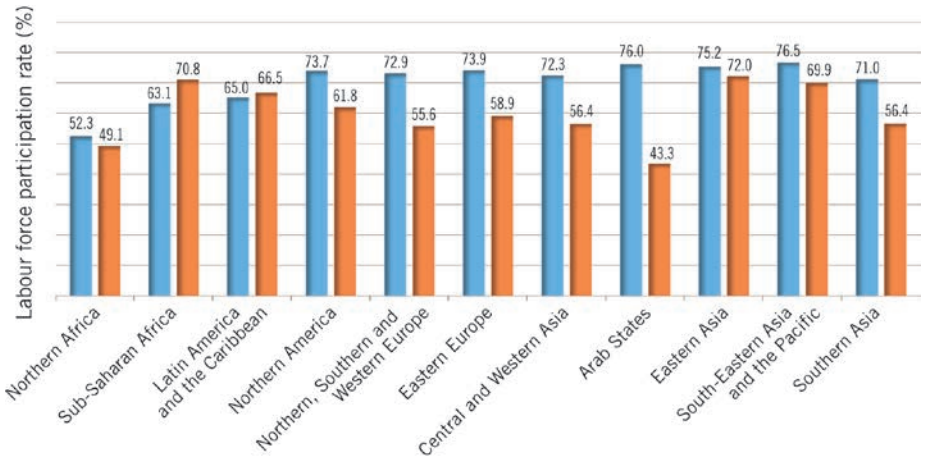
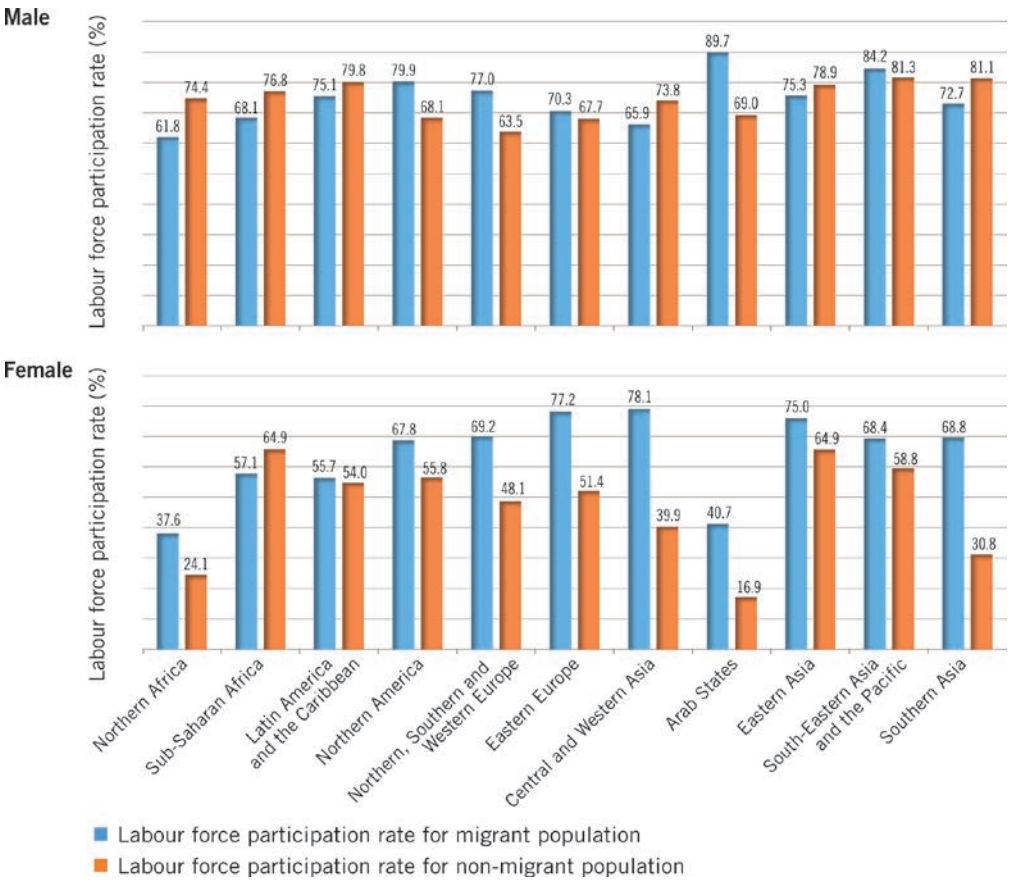


FIGURE **2.20**

Labour force participation rates of migrants and non-migrants, by sex and broad subregion, 2013



5 per cent and 10 per cent. In the remaining three regions, very small proportions of migrant workers are domestic workers.

There are significant gender differences across the subregions in the proportion of migrant domestic workers in all migrant workers (figure 2.24). Since a large proportion of domestic workers are female, the pattern for females is similar to the overall pattern (except for the fact that the ratio tends to be much higher for females than the corresponding overall value). The one exception is Southern Asia, where a much lower proportion of migrant domestic workers is female than male.

For men, the pattern of migrant domestic work to migrant work tends to be quite different. Over 10.4 per cent of male migrant workers are in domestic work in the Arab States region. Otherwise, values exceed 5 per cent only in Southern Asia and Sub-Saharan Africa, and are particularly low (0.3 per cent) in Northern America and Eastern Europe.

FIGURE **2.21**

Distribution of migrant domestic workers, by broad subregion, 2013 (percentages)

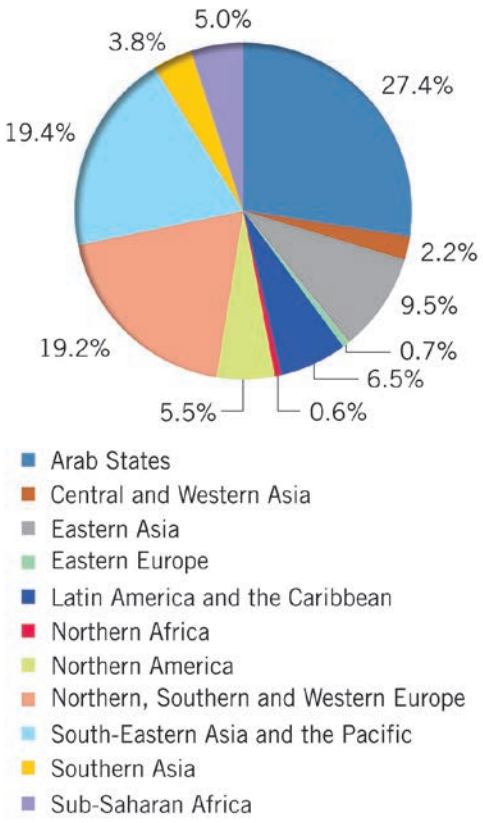
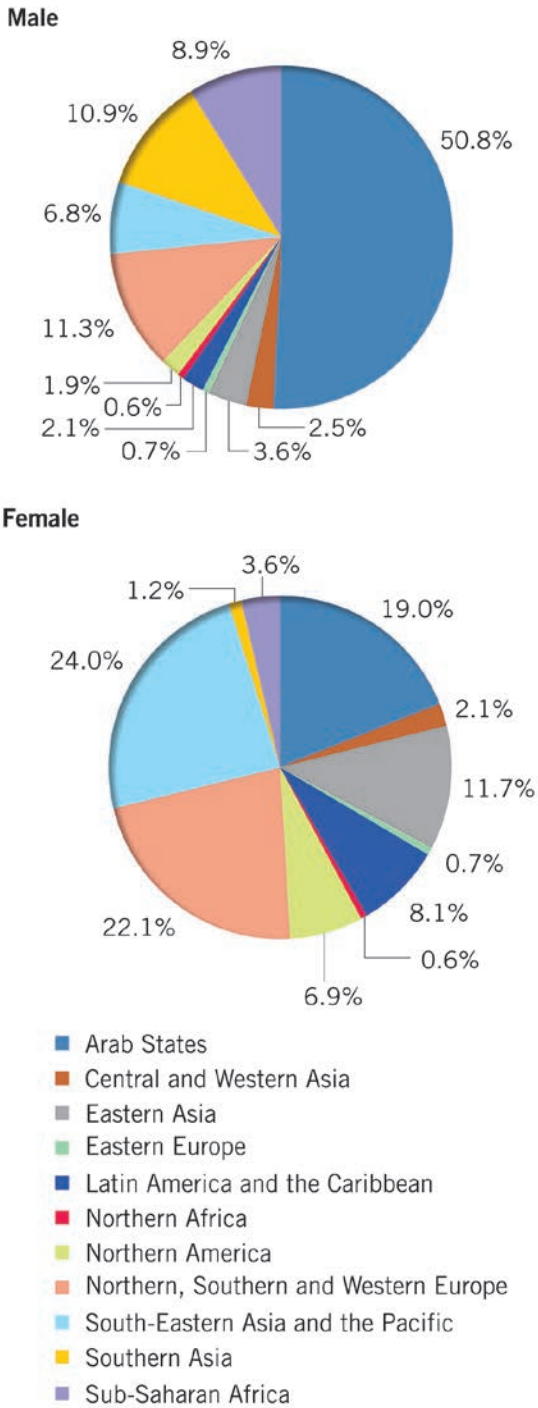


FIGURE **2.22**

Distribution of migrant domestic workers, by sex and broad subregion, 2013 (percentages)



While the share of migrant domestic workers among all domestic workers (figure 2.25) is particularly high in the Arab States region at 82.7 per cent, figure 2.26 shows that nearly all male domestic workers in the region are migrants (MD/D = 95.7 per cent). Though this figure may be subject to under-reporting on non-

FIGURE **2.23**

Migrant domestic workers as a share of all migrant workers, by broad subregion, 2013

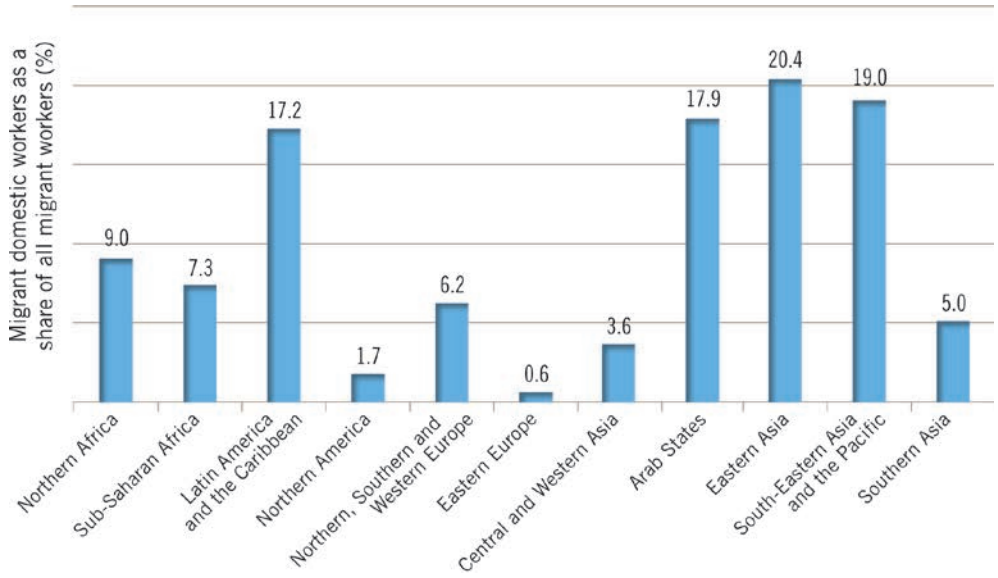
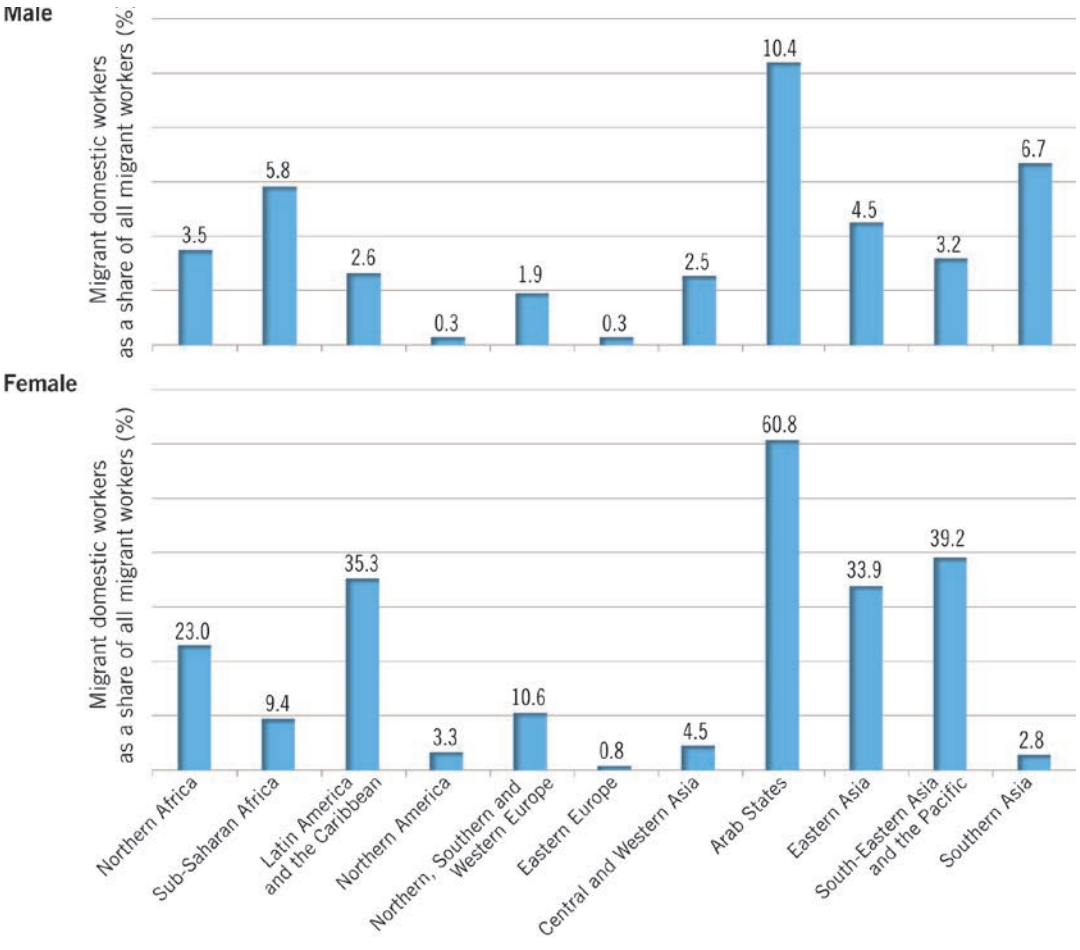


FIGURE **2.24**

Migrant domestic workers as a share of all migrant workers, by sex and broad subregion, 2013



migrant domestic workers, it is clearly exceptional. Two-thirds (68.3 per cent) of male domestic workers in Northern America are reported to be migrants. Other regions with relatively high ratios of around 30 per cent for male domestic workers include Eastern Europe; Northern, Southern and Western Europe; and Central and Western Asia.

The picture for female migrant domestic workers is rather different. While three-quarters (73.1 per cent) of female domestic workers in Arab States are migrants, the proportion of migrant domestic workers among domestic workers is also high in Northern America (71.0 per cent) and Northern, Southern and Western Europe (65.8 per cent).

FIGURE **2.25**

Migrant domestic workers as a share of all domestic workers, by broad subregion, 2013

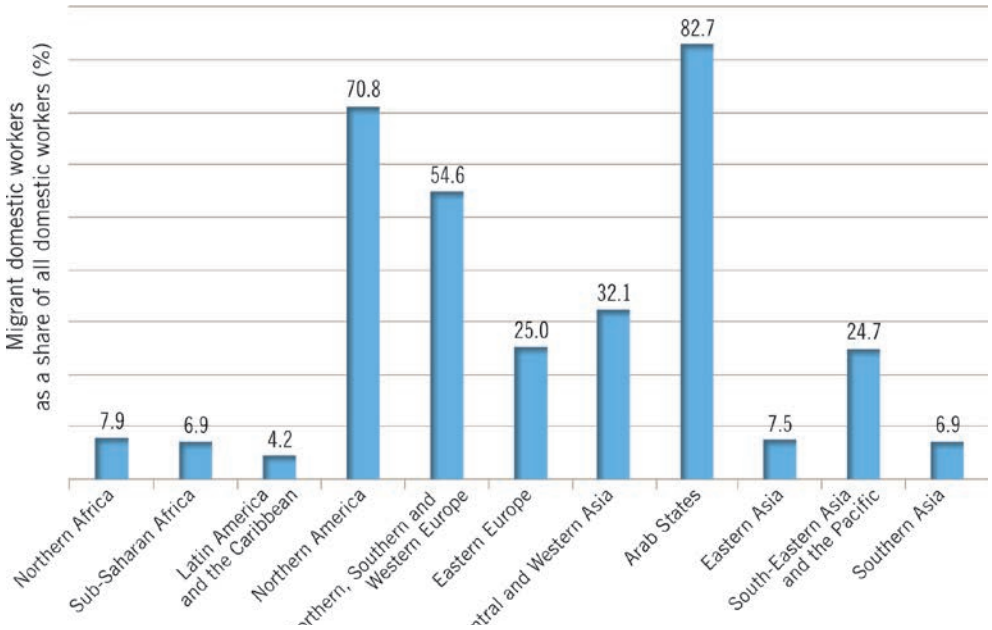
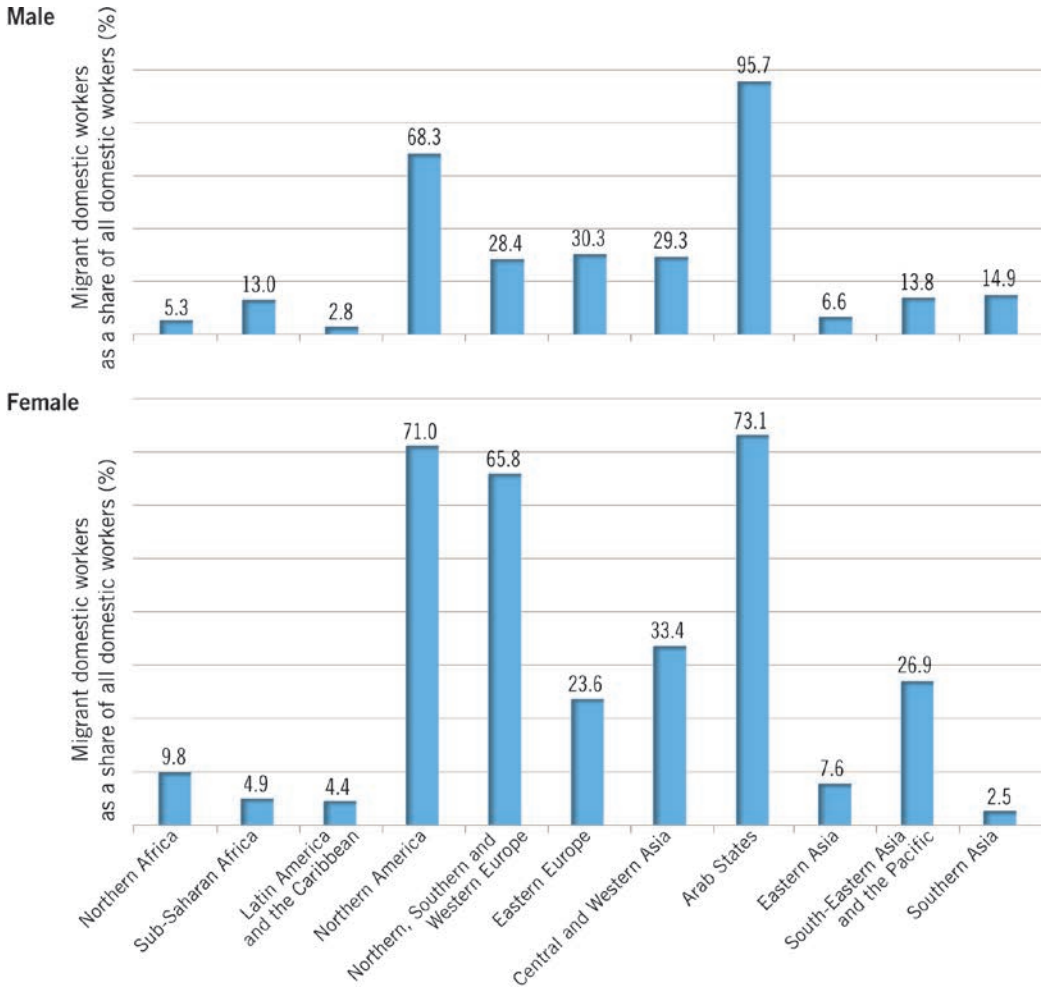


FIGURE **2.26**

Migrant domestic workers as a share of all domestic workers), by sex and broad subregion, 2013



3. Scope and definitions

This section explains the basic concepts and definitions, as well as the scope of what is covered by the estimates of migrant workers and migrant domestic workers presented in this report, starting with the data sources on the basis of which the measures are defined and constructed.

3.1 Benchmark data

The benchmark data refer to the year 2013 and cover 176 countries and territories, representing 99.8 per cent of the world's working-age population (15 years old and over). The countries are grouped into geographic regions in line with the ILO field structure (each region including countries covered by the ILO regional office and non-ILO member countries in the geographic region, together with broad and detailed subregional groupings). The countries are also grouped by level of income as defined in the World Bank's country income classification.[2]

The 176 countries and territories covered are listed in Annex C, classified according to the detailed subregion and income level group to which the country belongs.

The global and regional estimates of migrant workers and migrant domestic workers are based on three sets of benchmark data for 2013, namely world population (UN), stock of international migrants (UN), and labour force (ILO). These are available by sex and age group covering virtually all countries and territories. The three sets of data are described below.

3.1.1 UN population data

The Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat undertakes, on a regular basis, global demographic estimates and projections of world population. *World Population Prospects: The 2012 Revision* (UN, 2013a) covers 232 countries and territories with at least 90,000 inhabitants in 2012. The population data refer to mid-year and are available by sex and five-year age group for each country and territory for selected periods or dates between 1950 and 2100. Additional data on key demographic indicators are also available for each development group, major area, region and country.

The global population data are based on national data, mostly derived from the latest population censuses. In certain cases, the data refer to population registers or official estimates, and in a few cases to large-scale household surveys. The estimates and projections are made based on certain assumptions regarding fertility, mortality, international migration, and in certain countries on HIV/AIDS prevalence rate and modelling of mortality (UN, 2014).

Coverage and comparability

In ascertaining the size of a population it is necessary to define what is meant by population of a certain country or area. In census terms countries use two different ways of defining the population – de facto population or de jure population. The former is taken to be the population actually present at some moment of time, while the latter is a vaguer term referring to the population which is usually and/or legally resident in an area – the population which in some sense "belongs" to the area. Worldwide, the de facto type of census is considerably more common

2 The World Bank updates its country income classification once a year. For the purpose of ILO regional groupings, the latest World Bank income classification is used to recreate consistent series over time (i.e. the same country composition across years).

than the de jure type, although for many policy purposes the de jure population is more relevant. Sometimes it is possible to estimate both the de facto and de jure populations, and sometimes census counts fall between the two.

An important element of a count of the population enumerated in a census is a description of who is and who is not included in the count. In order to improve comparability between countries the United Nations makes recommendations concerning this, but there remain considerable variations in country practices.

3.1.2 UN international migration data

In the area of international migration, the United Nations Population Division estimates the global number of international migrants at regular intervals, monitors levels, trends and policies of international migration, and collects and analyses information on the relationship between international migration and development. Estimates of the stock of international migrants across the world are prepared on a regular basis. The latest edition of *Trends in International Migrant Stock* (UN, 2013b) contains estimates for mid-2013 by sex and five-year age group for 232 countries and territories. Estimates of the number of international migrants are available in the United Nations Global Migration Database. The basic data are obtained in the most part from national population censuses. Some of the data are obtained from population registers and nationally representative surveys.

The Population Division indicates that:

> Depending on the nature of the national data available, country of origin is recorded either as country of birth or as country of citizenship. In estimating the international migrant stock, international migrants have been equated with the foreign-born whenever possible. In most countries lacking data on place of birth, information on the country of citizenship of those enumerated was used as the basis for the identification of international migrants, thus effectively equating international migrants with foreign citizens.
>
> The approach of equating international migrants with foreign citizens when estimating the migrant stock has important shortcomings. In countries where citizenship is conferred on the basis of jus sanguinis, people who were born in the country of residence may be included in the number of international migrants even though they may have never lived abroad. Conversely, persons who were born abroad and who were naturalized in their country of residence are excluded from the stock of international migrants when using citizenship as the criterion to define international migrants. Similarly, using country of citizenship as the basis for the identification of international migrants has an important impact on the age distribution of international migrants, depending on whether citizenship is conferred mainly on the basis of *jus sanguinis* or *jus soli*.
>
> Despite these drawbacks, information by country of citizenship was used because ignoring it would have resulted in a lack of data for 43 countries or areas, equal to nearly 20 per cent of all countries and areas of the world. (UN, 2013b, pp. 4–5)

Regarding the coverage of refugees, the Population Division explains its principles as follows:

> The coverage of refugees in population censuses is uneven. In countries where refugees have been granted refugee status and allowed to integrate, they are normally covered by the population census as any other international migrant. In such cases, there is no reason to make a special provision for the consideration of refugees in estimating the international migrant stock. However, in many countries, refugees lack freedom of movement and are required to reside in camps or other designated areas. In these cases, population censuses may ignore refugees. Furthermore, when refugee flows occur rapidly in situations of conflict, it is uncommon for a population census to take place soon after and to reflect the newly arrived refugee population.
>
> Consequently, for many countries hosting large refugee populations, the refugee statistics reported by international agencies are the only source of information on persons who are recognized as refugees or find themselves in refugee-like situations. Figures on refugees reported by the Office of the United Nations High Commissioner for Refugees (UNHCR) and the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNWRA) have been added to the UN estimates of the international migrant stock for most developing countries. For developed countries, where refugees admitted for resettlement as well as recognized asylum-seekers are routinely included in population counts, no such adjustment was made. (ibid. p. 4)

3.1.3 ILO labour force data

ILO benchmark data on the labour force in 2013 are part of the ILO *Estimates and Projections of the Economically Active Population* (ILO, 2011). This database is a collection of country-reported and ILO-estimated labour force participation rates. The data refer to 191 countries and territories including the 176 countries covered by the present study. The reference period for the estimates is 1990–2010, while for the projections it is 2011–20. For countries with historical data prior to 1990 (but after 1979), estimates concerning the period prior to 1990 are also provided. The basic data are single-year labour force participation rates by sex and age groups. The historical estimates (1990–2010) are accompanied by detailed metadata for each data point regarding the source of collected data, the type of adjustments made to harmonize them when needed, and the type of imputation method used to fill missing data. The projections are based on a range of models allowing the capture of the impact of the economic development on labour force. In certain cases, use is made of projections recently published by national statistical offices.

Data must be derived from either a labour force (LFS) or household survey or a population census. However, a strict preference is given to LFS-based data, with population census-derived estimates only included for countries in which no LFS-based participation data exist. Data derived from official government estimates are in principle not included in the dataset, as the methodology for producing official estimates can differ significantly across countries and over time, leading to non-comparability.

A key objective in the construction of the database is to generate a set of comparable labour force participation rates (LFPR) across both countries and time, with no missing values left unimputed. As detailed in section 4.1, the main sources of non-comparability of LFPR include: (i) country-reported LFPR being derived from several types of sources, often not comparable; (ii) differences in the age groupings used in measuring the labour force; (iii) limited geographic coverage; and (iv) other sources such as differences in population coverage, concepts or treatment of particular groups.

3.2 International migrant

The UN recommendations on statistics of international migration define the "stock of international migrants present in a country" as "the set of persons who have ever changed their country of usual residence, that is to say, persons who have spent at least one year of their lives in a country other than the one in which they live at the time the data are gathered" (UN, 1998, para. 185).

This definition as it stands could be interpreted to count as a migrant a citizen of a country currently resident in that country, but who spent a year in another country at some point in his/her life. In practice, this definition is often not used. Since the present report refers to estimates of immigrants in destination countries, it could be preferable to refer to the more conventional understanding of an immigrant as a "person who moves to a country other than that of his or her usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes his or her new country of usual residence" (ibid., para. 36).

The concept used in the current estimates is, instead, that introduced in section 3.1.2 above. This approach is adopted for the practical reason that the UN Global Migration Database provides the necessary information for all the countries included in the present report.

This is a narrower definition formulated in terms of citizenship (foreign population) or place of birth (foreign-born population):

- *Foreign population.* All persons with usual residence in a given country who are citizens of another country. In the case of double or multiple citizenships, the person is generally considered a foreigner only if those citizenships do not include that of his or her country of usual residence.
- *Foreign-born population.* All persons with usual residence[3] in a given country whose place of birth is located in another country. Persons who have remained in the territory where they were born but

3 "Usual residence" is a complex concept and may be defined differently in different national sources. The UN Department of Economic and Social Affairs recommends "that countries apply a threshold of 12 months when considering place of usual residence according to one of the following two criteria: (a) The place at which the person has lived continuously for most of the last 12 months (that is, for at least six months and one day) … (b) the place at which the person has lived continuously for at least the last 12 months" (UN, 2008a, para.1.463, pp. 102–103). However, as noted, in practice many countries have used a different length of reference period for this purpose.

whose "country of birth" has changed because of boundary changes are not generally counted as foreign-born.

Some countries such as Canada and the United States that gather information on both place of birth and mode of acquisition of citizenship use a restricted definition of "foreign-born" for tabulation purposes: they regard as "foreign-born" only those persons who were born abroad and did not have a right to the citizenship of the country concerned at the time of their birth (in other words, persons who are not citizens by birth). Certain countries also apply in their national population censuses particular treatment for short-term migrants such as cross-border and seasonal migrant workers. The definitions used in several other countries combine "citizenship" and "permanent residency". In these cases, the data typically also include all persons who are not citizens of the country and do not have a permanent residence permit in that country.

A crucial concept affecting comparability of migration statistics concerns "residence". Normally, immigrants are identified as non-residents who enter the country with a view to establishing residence (becoming a resident). Just as in the case of determining the size of the population, the meaning of residence in the context of international migration can be taken from a legal (de jure) perspective, or from a de facto perspective. However, the meaning of these terms for the two purposes – of counting the population in a census, and of identifying international migrants – is not necessarily identical. In the context of international migration, de jure residence normally implies having a place of abode in a country and acquiring certain benefits and obligations, but without necessarily implying physical presence in the country at any moment or interval in time. The de facto perspective implies actually living or being present in the country for more than a minimum length of time. In practice, the minimum length of time for this purpose varies from country to country, mostly in the range of three to twelve months.

3.3 Migrant worker

According to the Migration for Employment Convention (Revised), 1949 (No. 97), the term "migrant for employment" means a person who migrates from one country to another with a view to being employed otherwise than on his or her own account. The scope of Convention No. 97 excludes "frontier workers", "members of the liberal professions and artistes", and seafarers (Article 11.2). The Migrant Workers (Supplementary Provisions) Convention, 1975 (No. 143) provides a slightly broader definition: it also encompasses persons who have migrated.[4]

The definition of "migrant worker" used in the present estimates takes a different view, and is more inclusive. It comprises all international migrants in the sense described in the preceding section who are currently employed or seeking employment in their country of current usual residence. The intentions or conditions of their entry into their current country of residence are not relevant for this purpose.

The term "migrant worker" thus includes unemployed migrant workers as well as migrant workers whose status in employment is employer or own-account worker or contributing family worker. It excludes, of course, persons who are currently employed in or are seeking employment in a country other than their country of usual residence.

3.4 Scope of the global and regional estimates

Clearly, a most important question is the following: what is the "scope" of the estimates, i.e. the population of migrants and migrant workers covered in this report?

Firstly, it should be noted that the present report is concerned throughout with numbers and characteristics of migrants in countries of destination. A migrant, migrant worker or migrant domestic worker is counted at the country of current residence.

3.4.1 Migrants

The population of *migrants* covered by the estimates presented here is defined by the nature of the data used for the purpose, namely the database on the stocks of international migrants produced by Population Division of the Department of Economic and Social Affairs of

4 Article 11(1) of Convention No. 143, which applies to Part II of that instrument, states: "… the term migrant worker means a person who migrates or who has migrated from one country to another with a view to being employed otherwise than on his own account and includes any person regularly admitted as a migrant worker." It should be noted that in addition to the categories excluded under Convention No. 97, Convention No. 143 also excludes students, trainees and employees of organizations in a country who have entered that country temporarily for an assignment and will leave on completion (Article 11(2)).

the United Nations Secretariat. Since the basic data in these projections are obtained in the most part from national population censuses, the migrant population identified can be regarded as a subset of the total population covered in the global demographic estimates and projections of world population, also undertaken on a regular basis by the UN Population Division. These global population data are based on national data, and again are mostly derived from population censuses. Only in a few cases do the data refer to population registers, other official estimates, or nationally representative large-scale household surveys. In short, the migrant population covered in the present estimates is essentially confined to the population covered in national population censuses. Whether a particular category or type of migrants can be included is determined by whether they are eligible for inclusion, and are included in practice, as residents in the national population censuses.

Furthermore, the estimates are confined to the adult population. In the vast majority of countries this is taken as population aged 15 and over, but in a few exceptional cases as 15–64.

3.4.2 Migrant workers

The term "migrant worker" as used in the present report is defined in section 3.3 above. The procedure used here to estimate the size of the population of *migrant workers* is detailed in section 6. Briefly, it involves the following two steps.

(i) From national data sources of the type described in section 4.2, such as the OECD Migration Database and the ILO Global and Regional Databases on Labour Migration, estimates are obtained of labour force participation rates of migrants.

(ii) These LFPR estimates can be multiplied by estimates of the total migrant population as described above to obtain corresponding estimates of the size of the population of migrant workers.

A basic requirement in computing ratio (i) is that the numerator (the number of migrant workers) and the denominator (the number of migrants) should be consistent in terms of the population covered and ideally come from the same statistical source. In coverage or numerical magnitude, the denominator of (i) is not necessarily identical to the estimate of the number of migrants in (ii).

The scope of the estimates of migrant workers presented in this report is limited by the coverage of both (i) and (ii), i.e. it is confined to the intersection of coverage of the two sources. Thus, for example, even if source (i) includes information on economic activity of migrant children aged under 15, our estimates do not cover that since (ii) has been restricted to population aged 15 and over, as noted above. Conversely, if (i) covers only the employed but not the unemployed population in some group (such as migrant domestic workers), the same limitation would apply to the estimates of the number of migrant workers for that group.

The total workforce engaged in a Country X is divided into two parts – non-working and working population. Migrants who are employed, or unemployed and seeking employment, are part of the working population of Country X and they fall within the scope of the global estimation. Migrant domestic workers fall within this category too.

Non-working migrants, i.e. persons who have migrated for reasons other than work such as dependants or students) are outside the scope of this report. In practice, however, some of those who have migrated for a reason other than work but who are currently working in country X may in fact be counted in the global estimate due to the nature and/or design of the measurement tool. To what extent these persons are covered by the global estimates is however unknown.

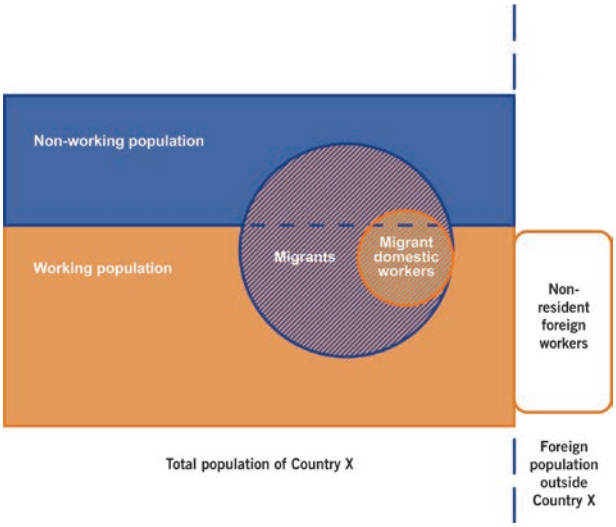
Non-resident foreign workers cross borders to perform work in Country X on a short-term basis; these include daily workers in services or seasonal workers in agriculture and construction, and so on. It should be stated that not all cross-border migration is necessarily of a seasonal nature. As shown in figure 3.1, cross-border migration for short-term work falls outside the scope of the global and regional estimates presented in this report.

Another group outside the scope of this report is refugees and asylum seekers – persons who have fled from persecution, war or other conditions of extreme danger or hardship in their countries. These form a separate category and are not covered in these estimates concerning migrants. Again, as in the case of those

individuals who originally migrated for reasons other than work, but are currently working, they may be captured by the global estimates; however the extent to which this has occurred is unknown.

FIGURE **3.1**

Estimates of migrant workers, schematic representation



Some examples are provided below for further clarification.

Returning migrants. These are persons who have been abroad (i.e. in a country other than their own) as migrants, and have returned to their own country to settle in it. They are most likely to be citizens of their "own" country and/or were born in it. They do not belong to population M as defined above, and therefore are excluded in the present estimates of migrants and migrant workers, irrespective of whether or not they are economically active.

Returning ethnics.[5] This refers to persons who are admitted by a country of which they are not citizens because of their historical, ethnic or other ties to that country, and are immediately granted right to permanent abode. That right makes them a part of population P, and they are within the scope of the present estimates until they acquire citizenship of their new country.[6]

Temporary migrant workers. This may cover a variety of arrangements, such as seasonal migrant workers, migrant workers who are tied to specific projects (and are not free to undertake other work), contract migrant workers, and other temporary migrant workers admitted for a limited period. These include non-resident foreign workers who cross borders to perform work at the country of destination on a short-term basis such as daily workers in services, seasonal workers in agriculture and construction, or foreign business travellers receiving remuneration in the country of origin (of course, not all cross-border migration is necessarily of seasonal nature). Normally such migrants would be excluded from the current estimates. However, the determining factor is not the condition under which such persons may have been given the right to enter the country concerned, but their de facto residential status at the current point in time.

Migrants for family reunification. The status, and hence potential inclusion in the estimates, of such persons is normally determined by that of the "primo-migrants" responsible for their permission to enter for residence in the country concerned.

Foreigners admitted for special purposes, such as foreign students, trainees, retirees. Often such persons are not included as a part of the resident population, especially when that is determined on a de jure basis (which usually implies having a place of abode in the country concerned and formally acquiring certain benefits and obligations). If so, they remain excluded from the present estimates.

The above two categories are examples of non-labour migrants, that is, persons who have migrated for reasons other than work. Again, it is important to note that the factor determining their inclusion or exclusion is not the condition under which such persons may have been given the right to enter the country concerned, but their de facto residential status at the current point in time. In practice, some of those who have migrated for a reason other than work may in fact be currently working in the country of destination. They should therefore be counted in the global estimates. To what extent these persons are actually covered by the present estimates is, however, unknown.

Irregular migrants. These are persons who have entered to stay in the country concerned, without fully satisfying the conditions and requirements set by that country for entry, stay or exercise of an economic activity. Often it is correct to include such persons in the estimates. However, many migrants and especially migrant workers in such circumstances remain undocumented. Dearth of data on undocumented migrant workers undoubtedly results in underestimation of their numbers.

5 The term is taken from Bilsborrow et al. (1997).

6 They will remain within the scope of the estimates if, in the country concerned, migrant status is determined in terms of country of birth rather than country of citizenship.

Refugees, asylum seekers, and other persons admitted for humanitarian reasons. The inclusion (or exclusion) of such persons is again determined by their right to residence and to undertaking work in the destination country. An additional consideration is whether they live in private households or in institutions or camps. Available data sources often cover only persons in private households. Persons with other living arrangements often remain uncovered, and hence outside the current estimates.

It should also be kept in mind that such persons, who often have fled from persecution, war or other conditions of extreme danger or hardship in their countries, form a separate category with special conditions, rights and obligations from the host government. Statistical information on them thus requires separate reporting in any case.

To summarize: "migrants for employment", or "economic migrants" may be distinguished from family reunification migrants, and from asylum seekers and refugees. However, in practice, most of the data sources will be unable to take account of reasons for migration and are likely to just record nationality/country of birth. However, this can actually be an advantage for the objective of the present estimates. The advantage is that all those who are economically active should be recorded in official statistics, which is closest to the concept we want to estimate.

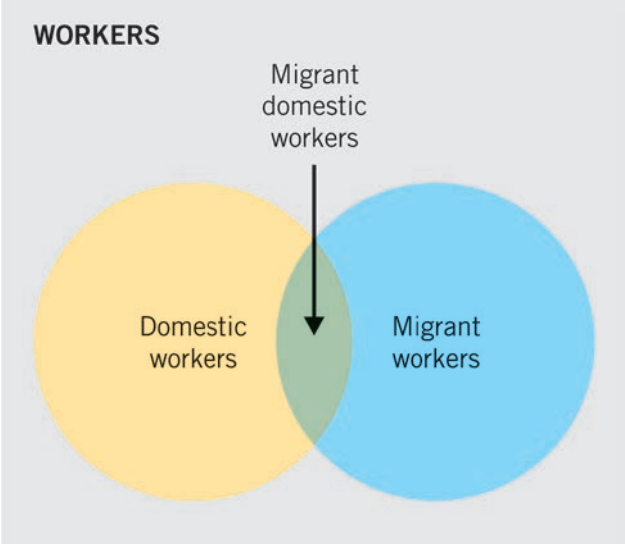
Of concern also is that some groups such as irregular migrants or those not resident in private households (e.g. those living in asylum and refugee reception centres) may not be recorded in official statistics such as censuses or labour force surveys, so they would be undercounted. This may be unavoidable. Nevertheless, the problem needs attention, as do the implications of omission of the above-mentioned groups. In the future, it would be very useful to have some idea of the numbers of irregular or undocumented migrant workers and what proportion of all migrant workers they form.

3.4.3 Migrant domestic workers

Figure 3.2 shows the scope of the global and regional estimates of migrant domestic workers. As migrant domestic workers are measured within the overall framework of migrant workers, cross-border domestic workers and other non-resident domestic workers are not included in the present scope of estimation.

FIGURE **3.2**

Estimates of migrant domestic workers, schematic representation



3.5 Breakdown by sector of economic activity

Estimates on migrant workers in this report are disaggregated according to the main sector of economic activity; the main sectors are agriculture, industry and services. Table 3.1 shows the composition of these main sectors in terms of the 21 sections defined in the latest International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4 (UN, 2008b).

In principle, migrant workers may be classified by branch of economic activity according to their main job in the case of employed migrants, and according to their latest job in the case of unemployed migrants with past employment experience. This procedure is admittedly flawed, in that it implicitly assumes that unemployed migrant workers with past employment experience have the same distribution by branch of economic activity as employed migrant workers, for whom the relevant data are more often available.

Unemployed migrants without past employment experience are not classifiable by branch of economic activity under these rules. However, for the purpose of the present study, all migrant workers are classified by branch of economic activity, including the unemployed without past employment experience.

The disaggregation of all migrant workers according to sector of economic activity is constructed as follows. It is available (or can be imputed) for present employment for migrants who are currently working, or for most recent employment if the migrant has worked before. The distribution obtained is then applied to all economically active migrants, including the unemployed with no past employment experience.

The resulting global estimates provide instructive information on the broad sectors of economic activity of migrant workers and pave the way for future improvements to the estimates, especially if in the next round of global estimates the ILO focuses attention on the labour force status of migrant workers, deriving separate global estimates on employed migrant workers and unemployed migrant workers. The breakdown by branch of economic activity may then be more meaningfully limited to employed migrant workers.

3.6 Domestic worker

The Domestic Workers Convention, 2011 (No. 189), defines domestic worker in its Article 1:

(a) the term "domestic work" means work performed in or for a household or households;
(b) the term "domestic worker" means any person engaged in domestic work within an employment relationship;
(c) a person who performs domestic work only occasionally or sporadically and not on an occupational basis is not a domestic worker.

In practice, there may be members or non-members of the household carrying out the domestic tasks for the household without having an obvious employment relationship. Examples could include persons such as foster children, orphans, distant relatives or unrelated household members. Also there may be cases where the domestic worker is considered as an own-account worker if working for more than one household.

The term "domestic work" in the ILO Convention refers to the tasks and duties of the domestic worker such as cooking, cleaning house, laundering, gardening, and so on. The tasks and duties define the occupation of the domestic worker, but no specific code or codes exist for exclusively identifying domestic workers in the ILO International Standard Classification of Occupations, ISCO-08 (ILO, 2012a) except for certain cases.[7]

In most national data used in the present study, domestic workers are instead identified on the basis of their branch of economic activity. As shown above in table 3.1, the International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4, classifies economic activities into 21 broad categories (sections) subdivided into divisions, groups and classes. Division 97 identifies Activities of households as employers of domestic personnel (UN, 2008b). The corresponding category in the previous ISIC Rev. 3.1 is Division 95: Activities of private households as employers of domestic staff.[8]

For some countries, the data on domestic workers are obtained from the relationship to the head or reference of the household. In the case of a few other countries, particularly in Latin America, the data on domestic workers are obtained from a special category of status in employment.

It should be mentioned that in all cases, domestic workers are identified through their main job. Thus, to the extent that some domestic workers are involved in domestic work only in their secondary or subsidiary jobs, the results based on main jobs underestimate the total number of employed persons engaged in domestic work. The data from the especially designed survey on domestic workers conducted in the United Republic of Tanzania in 2012 by the ILO indicate that about 6 per cent were engaged as domestic worker in their secondary job, their main job being other than domestic work (Kahayarara, 2013).

Another source of bias is the age limit used for estimation. The national data used here refer to the

7 The exceptions are Domestic helper (ISCO-08 code 9111), Domestic cleaner (ISCO-08 code 9121), Housekeeper (ISCO-08 code 5152) and Maid (ISCO-08 code 5162). Otherwise, the ISCO occupations are defined broadly and do not refer to domestic work specifically. For example, the occupational category Cook (ISCO-08 code 5120) may refer to both a cook engaged by a household or a cook working in a restaurant or for that matter in a hospital or in any another private or public institution. Similarly for drivers, gardeners, guards or nurses. Thus, domestic workers cannot be captured exhaustively in terms of occupations.

8 Division 97 of ISIC Revision 4 defines activities of households as employers of domestic personnel such as maids, cooks, waiters, valets, butlers, laundresses, gardeners, gatekeepers, stable-lads, chauffeurs, caretakers, governesses, babysitters, etc. It allows the domestic personnel employed to state the activity of their employer in censuses or studies, even though the employer is an individual. The product produced in this activity (e.g., cooked food, clean house) is consumed by the employing household. The activity excludes provision of services such as cooking, gardening, etc. by independent service providers (companies or individuals).

TABLE **3.1**

ISIC groupings of economic activity			
Section	**Divisions**	**Description**	**Broad category**
A	01-03	Agriculture, forestry, and fishing	Agriculture
B	05-09	Mining and quarrying	Industry
C	10-33	Manufacturing	
D	35	Electricity, gas, steam, and air conditioning supply	
E	36-39	Water supply; sewerage, waste management, and remediation activities	
F	41-43	Construction	
G	45-47	Wholesale and retail trade; repair of motor vehicles and motors	Services
H	49-53	Transportation and storage	
I	55-56	Accommodation and food service activities	
J	58-63	Information and communication	
K	64-66	Financial and insurance activities	
L	68	Real estate activities	
M	69-75	Professional, scientific, and technical activities	
N	77-82	Administrative and support service activities	
O	84	Public administration and defence; compulsory social security	
P	85	Education	
Q	86-88	Human health and social work activities	
R	90-93	Arts, entertainment, and recreation	
S	94-96	Other service activities	
T	97-98	Activities of households as employers; undifferentiated goods	
U	99	Activities of extraterritorial organizations and bodies	

Source: International Standard Industrial Classification of All Economic Activities (ISIC), Revision 4 (UN, 2008b). Available at: http://unstats.un.org/unsd/cr/registry/regcst.asp?Cl=27.

working-age population, specified as persons 15 years old and over. Child domestic workers below the age set for measurement of economic characteristics in national censuses and surveys are therefore excluded, a limitations that also applies of course to all estimates presented in this report. ILO global estimates on child labour, however, indicate that some 6.3 million children aged 5 to 14 years were engaged in domestic work in 2012, a slight decrease from 7.4 million in 2008 (ILO, 2010a; Etienne, Diallo and Mehran, 2014).

3.7 Migrant domestic worker

Migrant domestic workers are international migrants (in the sense described in section 3.2 above) who are engaged in their main job as domestic workers by households. They also include migrant domestic workers who are currently unemployed, as well as those who may be engaged in more than one household as an employee or own-account worker. They exclude however cross-border domestic workers who are not residents

of the country in which they work. It is important to spell out that the data on migrant domestic workers presented here exclude domestic workers who have migrated from one part of the country to another (internal migration).[9]

Also, to the extent that migrant domestic workers working irregularly are not reported in national censuses and surveys, the data presented here underestimate the global and regional number of migrant domestic workers. This comment applies to the global and regional estimates of migrant workers as well. However, the degree of underestimation may be relatively more important in the case of migrant domestic workers, as their activity takes place inside private houses and is therefore more likely to be undocumented in many countries.[10]

9 This limitation of course applies to all estimates presented in this report, which is concerned with international migration only.

10 On the other hand, there is anecdotal evidence that in some countries workers entering on a migrant domestic worker visa may in fact end up working elsewhere, possibly making themselves extra vulnerable to exploitation.

PART II
ESTIMATE METHODOLOGY

4. Methodology, Phase 1: Data sources and input data

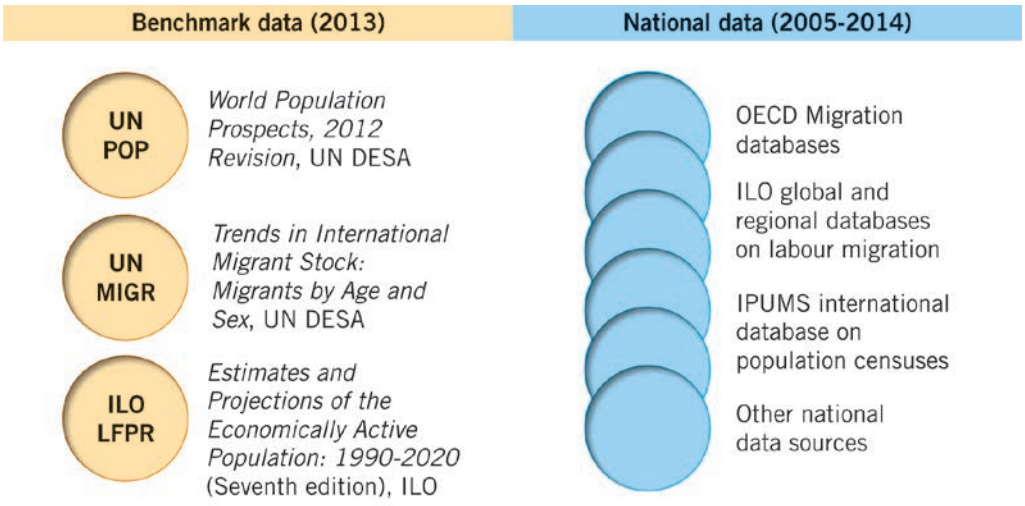
The data sources used in the present study are of two types, as shown in figure 4.1: (i) international data sources that provide benchmark data on population, stock of international migrants, and estimates and projections of the economically active population (labour force) for the reference year 2013; and (ii) national data on migrant workers, domestic workers and migrant domestic workers obtained from population censuses, labour force surveys and other large-scale household surveys with varied reference years ranging with a few exceptions from 2005 to 2014. Most national data have been compiled from international and regional databases and in a few cases from national sources directly.

4.1 Benchmark data

As noted in section 3.1, the global and regional estimates of migrant workers and migrant domestic workers are based on three sets of benchmark data for 2013: on world population (UN, 2013a), stock of international migrants (UN, 2013b) and labour force (ILO, 2011) covering virtually all countries and territories. In the current estimates of migrant workers, we take the benchmark data as complete and correct for all the individual countries included. However, the population figures are themselves estimates. The quality of the estimates presented in this report is affected by the degree of comparability of the benchmark statistics across countries of the world. With this in view, this section briefly describes how the benchmark estimates have been constructed on the basis of less-than-complete data.

FIGURE **4.1**

Data sources: Benchmark and national data



4.1.1 UN population data

For many countries, particularly in less developed regions, empirical demographic information may be limited or lacking and the available data can be unreliable. In these cases, models and indirect measures of fertility and mortality estimation have also been used to derive estimates. In fact, the overall analytical approach used in the 2012 Revision of *World Population Prospects* consists of four major steps:

1. *Data collection and estimation.* For each country, data from censuses, surveys, vital and population registers, analytical reports and o ther sources are collected, reviewed and used to estimate populations, fertility, mortality and net international migration components. In many cases, estimates derived from different sources or based on different modelling techniques can vary significantly, and all available empirical data sources and estimation methods need to be compared.

2. *Evaluation and adjustments*. In a second step the data are evaluated for geographical completeness and demographic plausibility. Post-enumeration surveys are used if available to evaluate the quality of census data. If necessary, adjusted data are obtained or adjustments are applied using standard demographic techniques.

3. *Consistency checking and cross-validation.* The next step is to integrate the separate estimates for fertility, mortality and migration. The estimates obtained from the preceding steps are subjected to a series of internal consistency checks on the relationship between the enumerated populations and their estimated intercensal demographic components.

4. *Checking consistency across countries*. Once all the various components of each country's estimates are calculated, the results are aggregated by geographical region and consistency checks comparing the preliminary estimates against those from other countries in the same region or at similar levels of fertility or mortality are conducted. An important component of the work at this stage is ensuring the consistency of information on net international migration, which for each five-year period must sum to zero.

4.1.2 UN international migration data

Among the 232 countries or areas included in this publication, 214 (representing 92 per cent of the total) had at least one data source on the total migrant stock by sex since the 1990 census round, while 76 per cent of countries or areas had at least one data source on the age of international migrants.

TABLE **4.1**

Countries or areas with at least one data source on international migrant stock, by age and sex, 1990, 2000 and 2010 (percentages)

		Countries with data available on migrant stock (%)					
		By sex			By age		
	No. of countries	1990	2000	2010	1990	2000	2010
World	232	78	75	50	53	56	24
Africa	58	74	52	31	43	29	12
Asia	50	70	74	54	34	52	30
Europe	48	79	92	75	48	79	33
Latin America and the Caribbean	48	83	77	38	79	65	21
Northern America	5	100	100	100	60	80	60
Oceania	23	91	96	57	74	61	17

In relation to coverage, 79 per cent of the total migrant stock was based an empirical data source. In relation to age, 55 per cent of migrant stock was based on an empirical data source.

The availability of data on total migrant stock, as well as on the age of international migrants, differs significantly between countries and regions, as summarized in table 4.1 showing census rounds between 1990 and 2010.

For the 2010 census round, which was still ongoing as of 2013, 31 per cent of countries in Africa had a data source on total migrant stock, while 12 per cent had recent data on the age of international migrants. Asia, and Latin America and the Caribbean, also had a relatively large number of countries or areas with no data for the 2010 census round on international migrants or their basic demographic characteristics; in Asia, 54 per cent of countries had a recent data source on total migrant stock and 30 per cent on the age of international migrants; while in Latin America and the Caribbean, 38 per cent of countries had a data source on total migrant stock and 21 per cent had data on the age of international migrants.

Data on the age of international migrants are presented for standard five-year age groups commonly used in demographic analysis, that is, 0 to 4, 5 to 9, etc. In many cases, the available data required some form of redistribution to ensure that the reported data could be used for estimates by five-year age group.

Estimation procedures differed as follows, depending on the number of data sources available in a country.

1. *Estimates for countries with two or more data sources*. For countries or areas with at least two data points, interpolation or extrapolation was used to estimate the migrant stock for the reference year. For the total migrant stock, estimates were also adjusted on the basis of other relevant information, including the estimated size of the total population in the country of destination based on the *World Population Prospects: The 2013 Revision*. In relation to the age of international migrants, the estimation method took into consideration the change in the size of the migrant stock, the ageing of the migrant stock, the age distribution of newly arriving and departing migrants, and the age distribution of the total population in the country of destination. Certain variations in these assumptions have been applied for specific groups, such as refugees who tend to be younger than other international migrants.

2. *Estimates for countries with only one data source.* For countries or areas with only one data source, different approaches were used. For total migrant stock, the growth rates of the total migrant stock in the relevant major area or region were considered. In relation to the age of international migrants, the estimation method also took into consideration the change in the size of the migrant stock, the ageing of the migrant stock, and the age distribution of newly arriving and departing migrants and of the total population in the country of destination. Again, certain variations in these assumptions have been applied for specific groups such as refugees, who tend to be younger than other international migrants.

3. *Estimates for countries with no data.* For countries or areas without any data sources, another country or group of countries was used as a model. These "model" countries were selected on the basis of various characteristics, including the use of the same criterion for enumerating international migrants, geographical proximity and migration experience.

4.1.3 ILO labour force data

The *Estimates and Projections of the Economically Active Population* (EAPEP) database is a collection of country-reported and ILO-estimated labour force participation rates, constructed with the aim of providing comparable LFPR across countries over time.

The main sources of non-comparability are as follows:

1. *Type of source.* Country-reported LFPR are derived from several types of sources including labour force surveys, population censuses, establishment surveys, insurance records and official government estimates. Data taken from different types of sources are often not comparable.

2. *Age group coverage.* Non-comparability also arises from differences in the age groupings used in measuring the labour force. While the standard age groupings used in the EAPEP database are 15-19, 20-24, …, 65+, some countries report non-standard age groupings, which can adversely affect broad comparisons. For example, some countries have adopted non-standard lower or upper age limits for inclusion in the labour force, with a cut-off point at 14 or 16 years for the lower limit and 65 or 70 years for the upper limit.

3. *Geographic coverage.* Some country-reported LFPR correspond to a specific geographic region, area or territory such as "urban areas". Geographically-limited data are not comparable across countries.

4. *Other factors.* Non-comparability can also arise from the inclusion or non-inclusion of military conscripts; variations in national definitions of the economically active population, particularly with regard to the statistical treatment of "contributing family workers" and the "unemployed, not looking for work"; and differences in survey reference periods.

The first step in the production of the EAPEP database is to carefully scrutinize existing country-reported LFPR and to select only those observations deemed sufficiently comparable. Two subsequent adjustments are made to the national LFPR data in order to increase the statistical basis (in other words, to decrease the proportion of imputed values); that is, harmonization of LFPR data by age bands, and adjustment based on urban data.

In total, comparable data are available for 39,169 out of a possible 130,262 observations, or approximately 30 per cent of the total. Response rates vary substantially among the different regions of the world. It is important to note that while the percentage of real observations is rather low, 174 out of 191 countries (91 per cent) reported LFPR in at least one year during the 1980 to 2010 reference period. Thus, some information on LFPR is known about the vast majority of the countries in the sample.

All missing values have been imputed. The database is a complete panel, that is, it is a cross-sectional time series database with no missing values. The basic missing value estimation model contains four methodological steps: first, in order to ensure realistic estimates of LFPR, a logistic transformation is applied to the input data file; second, a simple interpolation technique is utilized to expand the baseline data in countries that report LFPR in some years; next, the problem of non-response bias (systematic differences between countries that report data in some years and countries that do not report data in any year) is addressed and a solution is developed to correct for this bias; and finally, a weighted least squares estimation model is used to produce the actual country-level LFPR estimates.

4.2 National data

The national data on migrant workers, domestic workers and migrant domestic workers were mostly extracted from existing international databases. Additional national data were collected from publications or websites of national statistical offices.

4.2.1 OECD migration databases

The Organisation for Economic Co-operation and Development (OECD) manages several databases dedicated to international migration.[11] The main ones used for the present study were the database on labour market outcomes of immigrants and the database on immigrants in OECD countries (DIOC).

The database on labour market outcomes consists of a series of statistical tables on quarterly rates of labour force participation, employment and unemployment, by sex and place of birth. The data are mostly derived from national labour force surveys. They cover twenty-nine OECD member countries and include data for the period 2009 to 2013. The DIOC database includes detailed information, mostly derived from population censuses and population registers, on demographic characteristics (age and gender), duration of stay, labour market outcomes (labour market status, occupations, sectors of activity), field of study, educational attainment and place of birth. An extension of DIOC covering a number of non-OECD countries was not used here as it relates to the year 2000.

4.2.2 ILO global and regional databases on labour migration

The ILO database on labour statistics (ILOSTAT) provides statistics on international labour migration, which cover indicators on international migrant stock, international migrant flow and nationals abroad for selected ASEAN and Arab countries from 2001 to 2013.[12] The data are in the form of cross-tabulations.

The tables comprise information on stocks of the total employed population and employed migrant population by sex and country of origin, by occupation and by status

11 Available at: http://www.oecd.org/els/mig/oecdmigrationdatabases.htm.

12 Available at: http://www.ilo.org/ilostat/faces/help_home/data_by_subject?_adf.ctrl-state=148yhq79k_9&_afrLoop=524817554597542.

in employment, as well as inflows of migrants by sex, country of origin, occupation and economic sector. The database also includes three tables on nationals abroad by sex and country of destination, and outflows of nationals and employed nationals by sex and country of destination.

More recent data were collected from databases developed by the ILO Regional Offices, in particular the International Labour Migration Statistics (ILMS) databases for the Association of Southeast Asian Nations (ASEAN) and the Arab States (2015 edition),[13] and the *2012 Labour Overview for Latin America and the Caribbean* (ILO, 2012b). For global estimation of migrant domestic workers, the present study also made use of the database on domestic workers developed for the 2013 ILO report on domestic workers across the world (ILO, 2013c), which contains harmonized data on the total number of domestic workers in 2010 for 146 countries and territories, and by sex for 137 countries and territories.

4.2.3 IPUMS international database on population censuses

The Minnesota Population Center is a leading developer of demographic data resources. It maintains an International Public Use Microdata Series (IPUMS). The data are samples from population censuses from around the world taken since 1960. Names and other identifying information have been removed. The variables have been given consistent codes and have been documented to enable cross-national and cross-temporal comparisons. The data are disseminated free and are available online upon registration.[14]

At the time data were collected for this study, the IPUMS covered 79 countries, 258 population censuses and 560 million person records. The database included variables on sex, age, employment status (employed, unemployed, inactive) and nativity (native-born, foreign-born). It also included variables on branch of economic activity or industry according to the national classification of industrial activities (IND) as well as recoded (INDGEN) into twelve fairly consistent groupings roughly conforming to the UN International Standard Industrial Classification (ISIC). The third digit of INDGEN retains important detail among the service industries that permits, in many cases, the identification of domestic workers as "Private household services".

4.2.4 Other national data

To supplement the main databases described above, country data were also collected directly from national sources or reports, for example, the *EU Neighbourhood Migration Report 2013* (Fargues, 2013); *Brunei Labour Force Survey 2014* (JPKE, 2014); the Brazilian *National Household Sample Survey 2009* (IBGE, 2009); the *Namibia 2011 Population and Housing Censu*s (Namibia Statistical Agency, 2013), and *The Kuwaiti labour market and foreign workers: Understanding the past and present to provide a way forward* (Salvini, 2014).

In the important case of China, the available data were limited to domestic workers obtained as part of a survey carried out by the Ministry of Human Resources and Social Security (MOHRSS) in nine cities: Chongqing, Nanchang, Nanjing, Qingdao, Shanghai, Shenyang, Tianjin, Wuhan and Xiamen. The resulting aggregate estimate in these cities for 2003 is 240,000 domestic workers.[15] As part of its study on domestic workers across the world (ILO, 2013c), the ILO combined the MOHRSS data with other data to estimate that there were 9,390,000 domestic workers, or 1.2 per cent of total employment, in China in 2010.

The MOHRSS study further reported that as average income increases, the demand for domestic help should increase and consequently domestic work has the potential of generating 20 million jobs and 600,000 domestic service agencies in China in the long run. On the basis of this long-term projection, we have a used a simple model to extrapolate the limited empirical data available to obtain an estimate for 2013 of around 13 million domestic workers in China.

4.3 Constructing input data

The process of constructing global and regional estimates can be divided into two fairly distinct phases:

1. Construction of the input data file in a standardized form.

13 https://www.ilo.org/ilostat/faces/help_home/data_by_subject?_adf.ctrl-state=o4qkcx0ho_9&_afrLoop=401854832043421.

14 Available at: https://international.ipums.org/international/samples.shtml.

15 Asia Monitor Resource Centre: "Domestic work and rights in China" in http://www.amrc.org.hk/content/domestic-work-and-rights-china, 2007.

2. Imputation, adjustments for consistency, aggregation and production of global and regional estimates.

In terms of implementation, the basic difference between the two phases is that Phase 1 requires expert involvement and judgement at almost every step so as to be able to locate, select and edit data from diverse international as well as national sources resulting in as complete and as consistent an input dataset as possible. The outcome of this phase is an input data file in a standardized form at the level of individual country by sex, and possibly also by age or other classification variable(s) which may be incorporated in the future.

Once the input data file is available in a standardized form, the procedures for imputation, adjustments for consistency, aggregation and production of global and regional estimates in Phase 2 can be almost completely standardized.[16] Software can be developed to facilitate their repeated application to different input datasets in the specified form. They can form a tool for institutionalizing the production and periodic updating of global and regional estimates on migrant workers and migrant domestic workers.

This section is concerned with Phase 1. The different steps involved are described below.

For the present application, the construction of the standardized input data file has been carried out in an Excel file with three sheets, one storing the raw data, the second editing the raw data and calculating unique data points for countries with multiple data points, and finally the third sheet standardizing the data for the reference year 2013. These sheets have been developed by the ILO, and may be modified, updated and possibly made more detailed in future applications of the procedures.

4.3.1 Raw data

The first sheet stored the input data obtained from the national data sources. Each record corresponded to one data source from a specific reference year and a specific sex (male, female or total). In practice, there may be multiple input records for a given country if multiple data sources are used or if a single data source is used for different years, or even if there is a single data source for the same year but separate data for men and women. The input data were unedited and were recorded in the format of the national data source, in absolute numbers or in percentages.

4.3.2 Edited data points

The input data were then edited and stored in a second sheet called "Output". Editing involved first the calculation of data points for each record. A data point is one of the five ratios:

(i) the share of migrant workers in total labour force or total employment;

(ii) the migrant-specific labour force participation rate;

(iii) the share of domestic workers in total labour force or in total employment;

(iv) the share of migrant domestic workers among migrant workers; or

(v) the share of migrant domestic workers among all domestic workers.

If none of the data points could be calculated, the country-by-sex record would be rejected. Only records would be retained for which at least one data point could be calculated. Where the data points are ratios, an essential requirement is that both the numerator and the denominator come from the same source, so as to ensure that they are mutually consistent. As a rule, it is preferable that a data point is in the form of a ratio, rather than in the form of an absolute number, e.g. migrant workers as a proportion of all migrants aged 15+ rather than directly as an estimate of the number of migrant workers. This is because a ratio is less affected by coverage errors common to its numerator and the denominator.

The next step in the editing process is choosing between multiple data points referring to different sources or different reference years for the same item of information. An underlying factor in the choice among different sources on the same item of information always has to be expert assessment of the relative "plausibility" of the different sources. Beyond that, in general the more recent record containing the data point(s) was

16 Of course, expert judgement may be called for in certain cases, e.g. in the choice of "donors" when imputing across imputation "domains". These domains refer to cells in the cross-tabulation of detailed subregions and income groups.

retained. But in a few cases, the decision was made in favour of the record with the richer number of data points even if the record was not the most recent. An alternative could have been to choose the "best source" for each data point independently, though that may increase somewhat the number of different sources referred to for the same country.

At the end of the editing process, there would be at most three records for each country, one referring to men, one referring to women and one referring to both men and women. Also, each edited record may contain at most five data points, if for that country-by-sex record data were available on migrant workers, domestic workers and migrant domestic workers, as well as total labour force or total employment. A national estimate of the total number of migrants is not considered a data point for the present purpose, as it is not labour-related data and does not add to the information content of the study, given the existence of the benchmark data on the stock of international migrants covering all countries considered in the present estimates. A specified item of relevant information corresponds to a single data point – only one is chosen when there are multiple sources for the same item of information.

Hence, a data point means a country-by-gender level estimate obtained from a national data source of any one of the following:

(i) the number or the percentage of migrant workers among all migrants or all workers;

(ii) domestic workers among all workers; or

(iii) migrant domestic workers among all migrant workers or all domestic workers.

As noted, the present analysis is based on 176 countries (representing 99.6 per cent of the global working-age population) which are covered in the benchmark data sources.

The present estimates also include the disaggregation of migrant workers according to main sector of activity (agriculture, industry, services). However, having information available only on that breakdown, without having information on any of the five data points identified above, does not qualify a record for inclusion. In practice no such cases occurred in the input data. Information on breakdown by sector was available only for a subset of cases with information on total migrant workers (MW).

Additional data on migrant workers and migrant domestic workers are available from national sources or a large subset of the countries. The preliminary results of the ILO global and regional estimation of migrant workers and migrant domestic workers, presented in this report, are based on national data points from 134 countries and territories, covering about 94 per cent of the global labour force.[17]

There were altogether 1,056 national data points retained after editing. The figure includes national data points on men and women. Information on the presence or absence of data points by country and subject is given in Annex D of this report. This gives an average of (1,056/3x134)=2.6 data points per record (out of a maximum of 5.0) for the 134 countries with at least one data point available.

More information on data availability in terms not only of the number of countries covered but also on the share of the relevant population covered for different variables will be provided in the following sections on data quality and estimation methodology.

Figure 4.2 shows the distribution of the national data points by reference year. For ease of interpretation the counts are presented in terms of number of countries so that they add up to 134 – the total number of countries with retained national data points. It can be observed that the bulk of the data refer to the past five years. The model year is 2010–11, covering the reference year of the ILO global and regional estimates of domestic workers (ILO, 2013c). For three countries (Brazil, Brunei Darussalam and Kuwait) the dataset contains data for 2014.

Figure 4.3 shows the distribution of the retained country data by type of source. Most of the data were from population censuses, labour force surveys or other household-based surveys. Most of the population censuses were from two regions: the Americas and Europe, and Central Asia. Most of the LFS and other household-based surveys were from Africa, and Asia and the Pacific. The data from administrative sources were from China, Lebanon, Russian Federation, Singapore and Thailand. The national estimates were from Kuwait and the Philippines. A total of 142 sources were used to obtain the 1,056 retained national data points.

17 Seven data points and one country were subsequently deleted for reasons of inconsistency or incompleteness.

FIGURE **4.2**

Coverage of national data by reference year, 2005–14

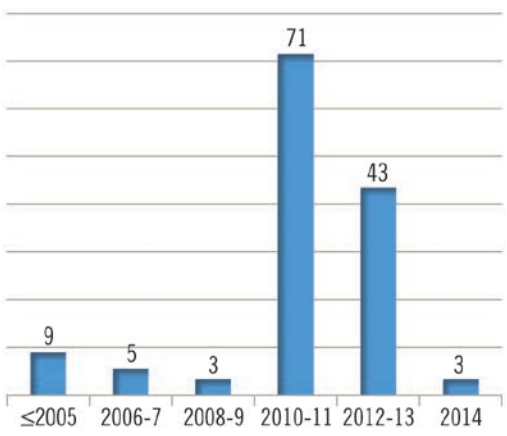
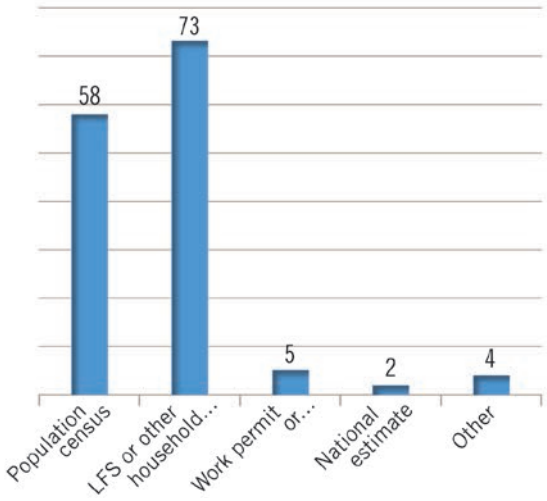


FIGURE **4.3**

Coverage of national data by type of source



The distribution of the retained country data on the main topics is shown in table 4.2. The figures are summed from Annex D over the 176 countries.

Considering total (T), 97 countries and territories had data on migrant workers, 126 on domestic workers, 73 on migrant domestic workers, and 60 on the breakdown of migrant workers by main sector. Not all country data were available for men and women separately. This applies in particular to data on migrant workers (MW). For 96 countries there were data on females (F), but only for 85 on males (M). In 112 countries, data on MW were available for at least one of the three populations: total (male+female, T), male (M), or female (F).

For domestic workers (D) data by sex were available for 126 countries, with figures only for males in one country. For migrant domestic workers (MD) for all the 73 countries with any data, the data were always available by sex. The same applied to migrant workers by broad branch of economic activity: data were found for 60 countries and territories, all of which were also disaggregated by sex.

4.3.3 Standardized input data for 2013

The edited data points serve to calculate standardized input data for 2013. The procedure is applied for each country with available data points, separately for males, for females, and for both sexes, as shown in table 4.3.

In addition to data points (1)-(5) above, at least one of which must be available for a country to be included in the database for estimation, there are three more data points (again for total, and separately by sex) concerning the distribution of migrant workers according to the main sector of activity:[18]

(6) the number or proportion of migrant workers in agriculture (AGR);
(7) the number or proportion of migrant workers in industry (IND);
(8) the number or proportion of migrant workers in services (SRV).

The use of the standardized input data for global and regional estimation of migrant workers and migrant domestic workers in the second phase of the estimation process is described in section 6, following the discussion of data quality in the following section.

18 As already noted, these additional three variables were available only in situations where some information related to the total number of migrant workers (MW) was also available. Hence these variables do not bring in any additional countries to the list with at least one data point in terms of variables (1)-(5) in table 4.3.

TABLE **4.2**

Summary of data availability, number of countries with information, by variable																
Migrant workers (MW)				**Domestic workers (D)**				**Migrant domestic workers (MD)**				**MW by main sector**				**Total**
T	**M**	**F**	**Any**	**T**	**M**	**F**	**Any**	**T**	**M**	**F**	**Any**	**T**	**M**	**F**	**Any**	
97	85	96	112	126	127	126	127	73	73	73	73	60	60	60	60	1 056

TABLE **4.3**

Calculation of standardized input data for 2013		
Variable	**Name**	**Calculation**
Benchmark data		
Population aged 15+ years	P	*UN World Population Prospects*
Migrant population aged 15+	M	*UN Trends in International Migrant Stock*
Labour force aged 15+	W	*ILO Estimates and Projections of the Economically Active Population*
Data points		
Migrant workers	MW	(1) M x Edited data point [MW/M] or
		(2) W x Edited data point [MW/W]
Domestic workers	D	(3) W x Edited data point [D/W]
Migrant domestic workers	MD	(4) MW x Edited data point [MD/MW] or
		(5) D x Edited data point [MD/D]

5. Data quality

5.1 Dimensions of data quality

Data quality has a number of dimensions. In the present context, the following six are particularly relevant:

- Statistical accuracy
- Consistency with other sources
- Robustness of the results to the use of different imputation methodologies
- Completeness of the input data
- Internal consistency of the results
- Data quality

5.1.1 Statistical accuracy

It is not possible to evaluate in any detail the statistical accuracy of the estimates obtained, since the input data used come from a great variety of national sources which are very heterogeneous in data quality. The estimates have been carefully constructed using transparent procedures, and it is believed that the results obtained are plausible and the best possible under the given circumstances. Nevertheless, the global and regional data presented in this report are likely to be an underestimate of the number of migrant workers and especially of the number of migrant domestic workers, both globally and for the various regions. The primary factor responsible for this is the lack of complete information. Labour migration across the world is also underestimated, as the procedures do not account for short-term or cross-border work-related migration, particularly in agriculture and construction as well as in domestic work. Another source of underestimation is the likely underreporting of irregular migration, not only in administrative records but also in national censuses and surveys.

5.1.2 Consistency with other sources

As an example of comparison with other sources, estimates of the number of domestic workers given in this study are compared with ILO 2010 global and regional estimates. The results are summarized in Annex F. The ILO's global and regional estimates of domestic workers in 2010 (ILO, 2013c) referred to 177 countries and territories, all included in the present study except Netherlands Antilles. The underlying data were obtained from national census and survey sources and in a few cases from administrative records. While the data used in the two studies overlap to a considerable extent, the estimation methodologies are rather different, as shown in box 1.

There are previous ILO estimates of migrant workers: for example, that there were 36-42 million in 1995 (ILO, 1999, p. 3, table 1); 86.2 million in 2000; and 105.5 million in 2010 (ILO, 2010b, p. 17, table 1.2). These previous estimates are not comparable to the 2013 figures due to differences in definitions, methodology and data sources used.

BOX **1**

Number of domestic workers: Comparison with ILO 2010 global and regional estimates

Estimation of the number of all domestic workers is not the primary objective of this report. Nevertheless, the number of all domestic workers is a parameter in the estimation of the number of migrant domestic workers and is therefore produced as a byproduct of application of the present procedure.

In 2013, the ILO published global and regional estimates of domestic workers in 2010 (ILO, 2013c). The estimates referred to 177 countries and territories, all included in the present study except Netherlands Antilles. The global number of domestic workers in the present exercise is estimated at 67 million for 2013 compared to a little under 53 million in 2010, an increase of over 25 per cent.

The definition of domestic worker was similar to the one adopted in the present study, namely, branch of economic activity codes 95 or 97 of the International Standard Industrial Classification of All Economic Activities (ISIC Rev 3, Rev 3.1 or ISIC Rev 4) or its national equivalent. However, the 2010 global estimate covered currently employed domestic workers, as opposed to the present study that in principle includes both currently employed and unemployed domestic workers.

The differences at the global level may be the result of a number of general factors described in more detail in Annex F of the present report. The most important include the following:

(i) Population growth between 2010 and 2013 is a factor contributing to the difference.

(ii) Additional contributions to increases over time may also come from socio-economic factors such as economic development, increased inequality and urbanization.

(iii) In addition, a part of the difference is due to the additional component of unemployed domestic workers included in principle in the 2013 estimate but not in the 2010 estimate.

(iv) There is more complete coverage of "industrialized" countries in the new estimates.

(v) The estimates for China have been revised upwards.

(vi) Corrections to the input data in order to improve their plausibility and consistency has resulted in revision upwards in a number of other countries. An important contributing factor is the availability of more and possibly better data for the 2013 estimates, not available for the 2010 estimates.

(vii) We believe that the present methodology is more precise and subject to less bias of underestimation.

5.1.3 Robustness of the results to the use of different imputation methodologies

The method of imputation in the present application is based on using regional averages to provide estimates for countries with missing information in the region, and using average values from neighbouring regions when no information is available for the region concerned. To evaluate the extent to which the global and regional estimates of migrant workers depend on the particular method of imputation adopted for treating countries with missing values, two alternative imputation methods have also been applied to the datasets, one based on regressions and the other on cross-product ratios.

In imputation using regressions, the method assumes a relationship between the labour force participation rate of migrant workers and the national labour force participation rate. After fitting the data, the parameters of the relationship are estimated and used to derive estimates of the labour force participation of migrants from the information on the national labour force participation of the country.

In imputation using cross-product ratios, the method used for the statistical treatment of countries with missing data on migrant workers is based on the calculation of cross-product ratios describing the relationship between migrant status and labour force status of the working-age population. The method was also adapted to the case of migrant domestic workers by considering the relationship between migrant status and domestic workers status.

The two methods are described in detail and their results compared in Annex E.

5.1.4 Completeness of the data

The lack of full information on all items in all countries is a major issue in the current estimation procedure. The problem is described in section 5.2, supplemented by information in Annex D. The solutions adopted are discussed.

5.1.5 Internal consistency of the results

There are a number of inherent relationships between the variables used in this study that should be reflected in the final estimates at any level of aggregation. Some of these are discussed in section 5.3.

5.1.6 Data quality

For the purpose of quality assessment, the underlying data used for global estimation of migrant workers and migrant domestic workers may be grouped into three parts: (1) international datasets on population, stock of international migrants, and economically active population or labour force;[19] (2) national datasets on migrant workers and migrant domestic workers; and (3) national census data on migrant workers by branch of economic activity.

1. *Population, stock of international migrants and labour force*. Procedures and data quality aspects of these sources have been described in sections 3.5 and 4.1. Sources of further information include *World Population Prospects, the 15th Revision* (UN, 2015); *Trends in International Migrant Stock: The 2013 Revision: Migrants by Age and Sex*: CD-ROM documentation (UN, 2013c).

2. *Migrant workers and migrant domestic workers*. The data on migrant workers and migrant domestic workers were collected from a variety of national and international sources by a team of statistical assistants specially hired by the ILO over a period of about four months from February to May 2015. The main criteria used for data collection were the reference period of the data (to the extent possible, not earlier than 2005) and the possibility of calculating consistent percentages such as the share of migrant workers in total labour force, the labour force participation of migrant workers, the share of migrant domestic workers among domestic workers or the share of migrant domestic workers among migrant workers.

The underlying national data were subject to a number of errors affecting the aggregate regional and global estimates. First, given the time constraint, the data collected did not cover all possible countries with available data on migrant workers and migrant domestic workers. Second, because of the variety of reference periods and definitions of migrant workers and migrant domestic workers used in the available national sources, the resulting data were in many cases not fully comparable and hard compromises had to be made in combining them.

3. *Migrant workers by branch of economic activity*. The underlying national data on migrant workers by branch of economic activity are obtained from the Integrated Public Use Microdata Series (IPUMS), described above in section 4.2.3. It is a collection of sample microdata based on subsets of full population data from countries around the world. The IPUMS samples are either systematically drawn from full-count data by IPUMS itself (or according to IPUMS specifications) or by the statistical offices of the country of origin according to a variety of complex sample designs. Samples drawn by countries of origin may include oversampling, clustering and stratification with potential effects on multivariate standard error calculation, and on weight computation to ensure representative estimates. Another source of potential error in the present context is the varied national classifications used for classifying the working population and migrant workers by branch of economic activity. IPUMS-International maintains a rich set of metadata on sample selections of census records, as well as the national census questionnaire and enumeration instructions in the original language, in pdf format and in English in html format.[20]

19 In principle, the estimation procedure in this report takes the value of "migrant-specific labour force participation rate" estimated from national sources, and multiplies it by the corresponding UN estimates of the number of migrants, to obtain an estimate of the number of *economically active migrants*. In practice, however, limitations in the available data result in departures from this ideal in some cases. This occurs when the available data cover only the employed part of the population but exclude the unemployed population. In such cases, the estimates are confined to the *employed population*.

20 Available at: https://international.ipums.org/international/.

5.2 Completeness of available data

A major issue in the current estimation concerns the lack of full information on all items in all countries. In section 4 and Annex D some information is provided on the availability of various items of information in the input file, by country and sex. In this section information is presented and analysed by country income group and broad subregion.

5.2.1 Coverage of national data by income level

Table 5.1 shows the number of countries with at least one data point available, classified by income level. It shows that low-income countries are much less well represented than middle-income and high-income countries: less than half (47 per cent) of the low-income countries and most (93 per cent) of high-income countries are covered.

The last column also clearly shows that the labour force coverage of countries steadily increases with income level. In low-income countries, the labour force coverage is 59 per cent, against 94 per cent in lower-middle income countries and 98 per cent in upper-middle income countries; the labour force coverage of high-income countries is virtually complete.

Overall, the percentage of labour force covered is considerably higher than the percentage of countries covered. This is because data tend to be more readily available for larger countries.

Table 5.2 shows the number of countries for which information on various items by gender was available, classified according to the countries' level of income.

Firstly, considering the overall level:[21]

The highest proportion (70 per cent) of countries have information on domestic workers (D). When available in a country, it is always available separately by sex.[22] By contrast, information on migrant domestic workers (MD) is missing in a much higher proportion of countries: it is available in 30 per cent of the countries with breakdown by sex, and in another 11 per cent only at the total level without breakdown by sex.

Concerning data on migrant workers (MW), information at the total level is available for 55 per cent of countries; for females information is available also for 55 per cent, and for males for 49 per cent of countries. These are not necessarily the same set of countries. In fact, 64 per cent of the countries have either full data by sex, or only at the total level without breakdown by sex, or in a few cases for only one of the categories by sex.

Information on breakdown of migrant workers by sector is available for a subset of these countries, amounting to only 35 per cent of the total number of countries. This means that of the countries for which information on MW is available, breakdown by sector is also available for around two-thirds of the cases (35/55=64%).[23] It should also be mentioned that in countries for which data by sector, MW(sec) , were available, the sector data were also available for male and female migrant workers separately, and the data for the three components were from the same source and the same reference year.[24]

There are generally sharp differences by income level. For low-income countries, information on any variable is available only for a minority – all in the range 23-33 per cent except for the higher figure (47 per cent) on domestic work. The proportion of countries with information is much higher in high-income countries for three of the variables – MW, D and MD. In contrast to MW, information on its breakdown by sector, MW(sec) does not improve much with increasing income level.

Table 5.3 shows the variation, for different variables, of the "proportion of the relevant population for which data are available". The variables involved are normally estimated as ratios, and the relevant population is the denominator of the ratio. For instance, in estimating the

21 The figures given here show some minor differences from the figures given in Annex D and summarized in the previous section. This is because of some further editing of the data during the analysis phase. For instance, it was possible to construct the figure for males if the information had been recorded at the total level and for females. One or two cases were deleted from the information on domestic workers and migrant domestic workers due to inconsistency.

22 Even though variable D has the largest proportion of countries with information recorded, in a number of cases it turned out to lack consistency or plausibility, as detailed in section 5.3.3.

23 It is possible for a country to lack information on the number of migrant workers (MW), but have information available on its breakdown by sector (MW(sec)). This is because the latter information is in the form of the ratio [MW(sec)/MW], where the numerator and the denominator come from the same source. The "MW" in the denominator of the above does not necessarily (and does not have to) correspond to the correct estimate of the variable MW. The latter is normally estimated from national information on LFPR of migrants [MW/M], multiplied by the number of migrants, M, estimated from the standard international sources.

24 It may be considered surprising that more countries have data on the number of migrant domestic workers than of migrant workers by sector, since domestic work is only one part of the service sector. However, the two items of information may come from different sources.

TABLE **5.1**

Coverage of countries with least one data point available, by income level

Income group	Countries and territories			Labour force
	Total no.	No. covered	% covered	% covered
Low income	30	14	47	59
Lower-middle income	44	33	75	94
Upper-middle income	44	33	75	98
High income	58	54	93	100
Total	**176**	**134**	**76**	**94**

TABLE **5.2**

Number of countries with data available on various items, by income level

		Total number	Migrant workers (MW)				MW by sector				Domestic workers (D)				Migrant domestic workers (MD)			
			T	%	M	F	T	%	M	F	T	%	M	F	T	%	M	F
Data available by income group																		
1	Low income	30	10	33	9	11	9	30	9	9	14	47	14	14	7	23	7	7
2	Lower-middle income	44	23	52	17	19	13	30	13	13	32	73	32	32	14	32	13	13
3	Upper-middle income	44	21	48	19	22	21	48	21	21	30	68	30	30	17	39	16	16
4	High income	58	43	74	41	44	19	33	19	19	48	83	48	48	34	59	17	17
	Total	**176**	**97**	**55**	**86**	**96**	**62**	**35**	**62**	**62**	**124**	**70**	**124**	**124**	**72**	**41**	**53**	**53**
	%	**100**	**55**		**49**	**55**	**35**		**35**	**35**	**70**		**70**	**70**	**41**		**30**	**30**

TABLE **5.3**

Proportion of the relevant population for which data are available, various items, by income group (percentages)

		Migrant workers (MW)			MW by sector			Domestic workers (D)			Migrant domestic workers (MD)		
		M(MW)/M			MW(Sec)/MW			W(D)/W			MW(MD)/MW		
		T	M	F	T	M	F	T	M	F	T	M	F
Data available by income group													
1	Low income	37	34	55	28	29	26	59	58	61	19	22	17
2	Lower-middle income	67	11	11	7	8	6	92	94	90	7	7	5
3	Upper-middle income	68	67	70	67	71	60	97	97	98	63	62	46
4	High income	88	94	87	63	59	68	97	97	97	71	54	55
	Total	**82**	**79**	**75**	**57**	**55**	**59**	**93**	**93**	**92**	**62**	**49**	**47**

number of migrant workers (MW) we normally estimate the LFPR of the population (MW/M), and multiply that by the known number of migrants, M. Hence the "proportion of the relevant population for which data are available" equals M, for which MW is known from the input data, written here as [M(MW], divided by M for the total population under consideration. For variable MW, this ratio (for total=male+female) is 37 per cent for low-income countries and 88 per cent for high-income countries – a sharp gradient by income level.

Similarly, for estimating the number of domestic workers (D), we normally estimate the proportion of domestic workers in the total labour force or all workers [D/W], and multiply that by the known number of workers W. Hence the "proportion of the relevant population for which data are available" equals W, for which D is known from the input data, written here as W(D), divided by W for the total population under consideration. For variable D, this ratio (again, for total=male+female) is 59 per cent for low-income countries and 97 per cent for high-income countries – a somewhat less sharp gradient by income level.

For both migrant workers by sector, MW(sec) and migrant domestic workers, MD, the relevant population is the number of migrant workers, MW. For the first variable, the "proportion of the relevant population for which data are available" equals MW, for which breakdown by sector is known from the input data, divided by MW for the total population under consideration; and similarly for MD.[25]

For the two last-mentioned variables, the proportion increases sharply as we move from low income to high income groups, but with one major exception: the proportion is extremely low for the lower-middle income group of countries.

Overall, the ratios in terms of the base population covered are higher than the proportion of countries with available data, for instance 82 versus 55 per cent for MW, and 62 versus 41 per cent for MD. This is because, as already noted, data tend to be more readily available for larger countries.

Finally, a brief comment on the differences in the availability of breakdown by sex follows. Generally, when information is available for the total population it is also available separately for males and females. An outstanding exception is information on migrant workers (MW) in the lower-middle income group: it is usually available only for the total population, without breakdown by sex.

In the case of MD, the figure for females is notably lower than that for males; this is connected with the fact that a much higher proportion of female migrant workers are domestic workers and the female-to-male ratio of MW varies across countries.

5.2.2 Coverage of national data by broad subregion

Table 5.4 shows information on data availability classified by broad subregion. In Sub-Saharan Africa, the four variables shown are missing in a majority of the countries; while the Eastern Asia and Southern Asia subregions also include a high proportion of countries where data are missing.

In Eastern Asia, there are no countries with information on migrant domestic workers, MD.

In Southern Asia, information on both breakdown by sector, MW(sec), and migrant domestic workers, MD, is available for only one in ten countries.

Table 5.5 shows proportions of the relevant population for which data are available on various items, by broad subregion. The interpretation of these measures is the same as that given above in the discussion by income level.

Again, the ratios in terms of the base population covered are higher than the proportion of countries covered, since data tend to be more readily available for larger countries.

In Latin America and the Caribbean, Northern America, and Northern, Southern and Western Europe, the proportion of data available is around 90 per cent, with the exception of MW(sec) in the first of the above-mentioned subregions. However, in the Northern, Southern and Western Europe subregion, breakdown of MD by sex is missing in a third of the population. The pattern of availability by sex is uneven also in some other cases, as can be seen in the table.

25 In computing these ratios for MW(sec) and MD, we have used the "full" value of MW, meaning MW after imputation for missing values for it (imputation procedures are described in the next section). In fact, the amount of missing information on MW(sec) and MD given in the tables here can be viewed as consisting of two components: the proportion of information missing on the variable concerned where MW is available, multiplied for the proportion of information missing on MW itself (as given in the first column of the table). This gives 57/82=70% for MW(sec) and 62/82=76% for MD among cases with MW available in the input data.

TABLE **5.4**

Number of countries with data available on various items, by broad subregion

		Total number	Migrant workers (MW)				MW by sector				Domestic workers (D)				Migrant domestic workers (MD)			
			T	%	M	F	T	%	M	F	T	%	M	F	T	%	M	F
11	Northern Africa	6	3	50	3	3	3	50	3	3	4	67	4	4	3	50	3	3
12	Sub-Saharan Africa	45	15	33	12	13	11	24	11	11	22	49	22	22	9	20	9	9
21	Latin America and the Caribbean	30	19	63	18	19	17	57	17	17	24	80	24	24	18	60	18	18
22	Northern America	2	2	100	2	2	2	100	2	2	2	100	2	2	1	50	1	1
31	Northern, Southern and Western Europe	28	21	75	20	23	12	43	12	12	23	82	23	23	17	61	7	7
32	Eastern Europe	10	7	70	7	6	2	20	2	2	8	80	8	8	5	50	2	2
33	Central and Western Asia	11	4	36	5	5	3	27	3	3	9	82	9	9	3	27	2	2
41	Arab States	12	11	92	9	9	2	17	2	2	10	83	10	10	9	75	4	4
51	Eastern Asia	7	1	14	0	2	2	29	2	2	6	86	6	6	0	0	0	0
52	South-Eastern Asia and the Pacific	16	10	63	9	11	7	44	7	7	10	63	10	10	6	38	6	6
53	Southern Asia	9	4	44	1	3	1	11	1	1	6	67	6	6	1	11	1	1
	Total	**176**	**97**	**55**	**86**	**96**	**62**	**35**	**62**	**62**	**124**	**70**	**124**	**124**	**72**	**41**	**53**	**53**

5.3 Internal consistency requirements

There are a number of inherent relationships between the variables used in this study that should be reflected in the final estimates at any level of aggregation.

5.3.1 Total = Male + Female

A most obvious and important requirement for consistency is that numbers of "male + female" should be equal to the total population for any variable at the country level as well as at regional and global levels.

There are many instances of input data based on national sources used in the present exercise where this requirement is not satisfied in the numbers available for total and for male and female separately. Generally the procedure used here did not attempt to adjust individual input data items to conform to this requirement. Rather, the relationship "Total = Male + Female" has been built into the methodology so as to ensure that it holds in all *derived* estimates at the country, regional and global levels.

The above applies to the variables MW, MW(sec), D and MD based on data from diverse national sources. The three benchmark variables P, W and M, coming

TABLE **5.5**

Proportion of the relevant population for which data are available, various items, by broad subregion (percentages)

	Migrant workers (MW)			MW by sector			Domestic workers (D)			Migrant domestic workers (MD)		
	M(MW)/M			MW(Sec)/MW			W(D)/W			MW(MD)/MW		
	T	M	F	T	M	F	T	M	F	T	M	F
Data available by income group												
11 Northern Africa	41	36	48	40	36	48	91	91	90	40	36	48
12 Sub-Saharan Africa	47	37	39	34	35	32	71	71	71	30	32	27
21 Latin America and the Caribbean	92	91	92	63	65	62	98	98	98	91	92	90
22 Northern America	100	100	100	100	100	100	100	100	100	87	93	80
31 Northern, Southern and Western Europe	96	96	99	87	89	85	96	96	96	92	67	63
32 Eastern Europe	35	68	9	3	3	3	81	82	81	9	3	3
33 Central and Western Asia	41	44	45	40	40	41	79	79	78	40	20	23
41 Arab States	95	93	84	9	7	17	84	84	84	65	14	27
51 Eastern Asia	16	0	41	11	13	10	98	99	98	0	0	0
52 South-Eastern Asia and the Pacific	92	81	83	38	41	35	85	86	83	38	40	35
53 Southern Asia	82	20	29	14	23	1	99	99	99	14	23	1
Total	**82**	**79**	**75**	**57**	**55**	**59**	**93**	**93**	**92**	**62**	**49**	**47**

from standard international sources and available by sex for all countries, are expected to satisfy the relationship "Total = Male + Female". In the present exercise, this indeed was found to be true in the case of total population aged 15+ (P) and total number of migrants aged 15+ (M), but not in the case of the total labour force or working population (W). The details were as follows.

For W, the requirement M+F=T was violated in the input data in 38 of the 176 countries with data available by 10 ('000) or more, in 29 of the 176 countries by 20 ('000) or more, in 19 countries by 50 ('000) or more, and in 9 countries by 100 ('000) or more. The net difference over all the countries was quite small, but gross differences were more significant, and quite large in some countries.

In the data used for the construction of global and regional estimates, this discrepancy was removed by resetting the numbers total (say, T1), male (M1) and female (F1) in each country as follows.

T2 = max(T1, M1+F1)

M2=M1*T2/(M1+F1)

F2 = F1* T2/(M1+F1)

so that M2+F2 = T2 is ensured.

The world total of T increased only by a very small amount (by around 1.6 million, or 0.05 per cent), but in some countries the correction was significant.

The above shows the importance of making even such simple internal consistency checks. In constructing the variables, it is often necessary to do so repeatedly following steps involving other data adjustments, as detailed in section 6 below.

5.3.2 Inherent relationships among the variables

There are a number of inherent relationships among the variables that need to be satisfied and hence must be built into the methodology. Specifically, the following seven relationships must be satisfied by data for each country, for the total population and separately for males and females:

MW≤M
MW≤W
MW(AGR)+MW(IND)+MW(SRV)=MW
D≤W
MD≤MW
MD≤D
MD≤MW(SRV)

Variables MW(AGR), MW(IND), MW(SRV) refer to migrant workers in, respectively, agriculture, industry and services.

It is necessary to check the variables and make the necessary corrections where possible, to ensure that the above consistency requirements are satisfied. Ideally this should be done for the input data, and then subsequently at various stages during the construction of the final estimates.

5.3.3 Plausibility

The input data and the out estimates should be "plausible". Plausibility is a vague and complex, yet useful, concept. Essentially, it implies that if the data are clearly outside the range of values which can be expected – on the basis of experience, comparison with similar statistics, logic of the situation, or even subjective expert assessment – then they are not plausible.

It is on such basis that some of the input data have had to be modified or rejected, and/or statistical procedures chosen so as to reduce the risk of obtaining results which appear implausible. The following example illustrates this point.

Errors in the input data for domestic workers (D)

(i) In some cases input data on domestic workers were implausible. For instance:

- In Australia, the input values of D were meaninglessly too low (practically =0), and have been deleted (to be imputed along with other countries with no data).
- In three other countries (Cape Verde, East Timor, Trinidad) the data provided were too incomplete to be useful, and have been similarly deleted (and later imputed, of course, just as any other missing data).
- In a couple of other countries, the given value of D is so small that it falls short of the given value of MD (number of migrant domestic workers). We substituted the latter value for the former. This is the minimal correction required.
- After deleting Australian input data, only New Zealand was left in domain 5224, which was too limited a base to use for estimation (also the figure for that country looked far too low, much like the case of Australia). Therefore, that figure was also not used and the estimate for domain 5224 was obtained from domain 5214. This is a domain in the same income group ('4' – high income), in the same broad subregion, but in a different detailed subregion (there are no other detailed subregions in the broad subregion 522).[26]

(ii) The requirement 'Total = Male + Female' is seriously violated in the input data, at the country level and also at the regional and global levels. Total T in the given data fell short of (M+F) by nearly 20 per cent in net terms. The gross discrepancy was nearer 25 per cent. Though the estimation procedure has been designed to ensure this condition at the end, it was the input data which needed to be corrected beforehand.

(iii) It is clear that the given values of D are too low in comparison with MD values in a number of countries. A consequence of this was that the "final" values obtained after imputation of D were below even the corresponding values obtained for MD in 16 of the 176 countries included in the analysis. Half of these countries were from Eastern Europe including Commonwealth of Independent States (CIS) countries, and a quarter were from Eastern and South-Eastern Asia. Such geographical clustering of the pattern may reflect similar data situations in the countries involved.

Consequently, a final correction to estimated D values was introduced, in that they could not be smaller than

26 Regions and subregions at different levels of detail have been defined in section 3.

the estimated MD in the same country. In fact, because of the shortcoming of data on D, we removed the constraint

$$MD \leq D$$

meaning that in the given data MD cannot exceed D (and if so, the value of MD be revised downwards). Rather, the constraint was now applied *in reverse*

$$D \geq MD$$

meaning that D cannot be less than MD, and if so, the determined value of D was revised upwards.

The same was applied to the final estimates after imputation. If the estimate of MD exceeded that of D, then the former was not adjusted downwards; rather the latter was adjusted upwards so as not to be less than estimated MD at the country-by-sex level.

In short, in a number of cases the information compiled during the input phase (Phase 1) from diverse national sources was incomplete and subject to contradictions. Steps have been taken to improve consistency where possible.[27]

27 It should be noted in particular that in the case of China there is a large uncertainty in the number of domestic workers in the country. Fortunately, the statistic of real interest in this report is the number of migrant domestic workers. Given the very low migration rates into very large countries like China (and similarly, India), estimates of the numbers of *migrant* domestic workers (MD) are not likely to be greatly affected by the estimated numbers of all domestic workers (D) in these cases.

6. Methodology, Phase 2: Data imputation and production of global and regional estimates

6.1 Introduction

The objective of the imputation procedure is to construct a set of variables at the level of individual country (in the set of 176 countries included in the analysis), for the total population and separately for males and females (table 6.1).[28]

Section 6.2 considers the base variables, while section 6.3 describes the general procedure used for imputing missing values in the variables constructed from national data sources. Sections 6.4-6.7 provide details of the steps involved in the construction of variables MW, MW(sec), D and MD in turn.

6.2 Benchmark variables from standardized international datasets

As noted in section 4, the benchmark data refer to the year 2013 and cover 176 countries and territories,

TABLE **6.1**

Variables to be estimated		
Variable	**Name**	**Calculation**
Benchmark variables from standardized international datasets		
Population aged 15+ years	P	*UN World Population Prospects*
Migrant population aged 15+	M	*UN Trends in International Migrant Stock*
Labour force aged 15+	W	*ILO Estimates and Projections of the Economically Active Population*
Variables constructed from national data		
Migrant workers	MW	(1) M x Edited/imputed value [MW/M]
Domestic workers	D	(2) W x Edited/imputed value [D/W]
Migrant domestic workers	MD	(3) MW x Edited/imputed value [MD/MW] or
Migrant workers by main sector ARG (agriculture) IND (industry) SRV (services)	MW(sec)	(4) MW x Edited/imputed [MW(ARG)/MW] (5) MW x Edited/imputed [MW(IND)/MW] (6) MW x Edited/imputed [MW(SRV)/MW]

28 Classification of the population by age and sex simultaneously is not covered in the present estimates, but may be introduced in future productions of the global and regional estimates of migrant workers and migrant domestic workers.

representing 99.8 per cent of the world working-age population (15 years old and over). The three "benchmark variables" (P, W and M) coming from standard international sources are available by sex for all countries. Nothing more needed to be done on input data for these variables, except to verify that they satisfy the relationship '"Total = Male + Female'".

In the present exercise, this indeed was found to be true in the case of total population aged 15+ (P) and total number of migrants aged 15+ (M), but not in the case of the total labour force or working population (W). In the data used for the construction of global and regional estimates, this discrepancy was removed by resetting the numbers total (say, T1), male (M1) and female (F1) in each country as follows.

$$
\begin{aligned}
T2 &= \max(T1, M1+F1),\\
M2 &= M1*T2/(M1+F1)\\
F2 &= F1*T2/(M1+F1)
\end{aligned}
$$

so that M2+F2 = T2 is ensured.

The above adjustment procedure to ensure the consistency "Total = Male + Female" has in fact been used repeatedly in the present procedure for the construction of all variables.

6.3 Outline of the imputation procedure

Variables MW, MW(sec), D and MD are constructed from ratios involving them as specified in section 4.3.3 (table 4.3). For instance, D is constructed from ratio [D/W] obtained from national data sources, multiplied by W provided by the benchmark data; similarly MW may be constructed from ratio [MW/M] obtained from national data sources, multiplied by M provided by the benchmark data.

In order to distinguish between information coming from these two types of source, we will use the following notation.

Quantities in square parentheses [..] such as "[MW/M]" refer to ratios based on country-by-sex level data where the numerator and the denominator both come from the same source and hence are compatible.

Aggregate quantities (usually in terms of numbers of adult persons in thousands) have been obtained from standardized international sources or are constructed using the procedures to be described here. These are written without parentheses, such as "M", or their ratios in round brackets (..) as in (W/M).

Generally, variables in this section refer to values at the "case" (country-by-sex) level; for simplicity, no subscript is used to identify an individual case. Rather, we will use subscripts '$_{INPUT}$' and '$_{IMPUTED}$' to distinguish between the given case values from national data sources and the final values after imputation for missing values. When necessary, subscript '$_{av}$' is used to indicate values averaged over a "domain" (a cell in cross-classification by detailed subregion and income group).

In order to outline the imputation procedure in general terms, let us use "Y" for a variable like MW or MD to be estimated, and "X" for the variables in the denominator of the ratio [Y/X] involved in its construction using the relationship Y = X * [Y/X]. As noted, quantity [Y/X] comes from national data sources, and X comes from the benchmark databases.

Variable construction involves the following steps.

1. Obtain $[Y/X]_{INPUT}$ from national input data source if this information is available, as described in section 4. This is at the country level, and for total and separately for male and female populations.

2. Obtain X from benchmark database, or from previous imputation of the variable (as for instance MW for [MD/MW]), and where ratio $[Y/X]_{INPUT}$ is available, compute

$$Y_{INPUT} = X * [Y/X]_{INPUT}.$$

3. For cases (countries, by sex) for which $[Y/X]_{INPUT}$ is available, sum up the Y_{INPUT} values and the $X_{Y=INPUT}$ values separately over the domain to which the countries belong. Symbol $X_{Y=INPUT}$ means that the sum of X values is taken over cases for which [Y/X] and hence Y is available. Domains refer to groupings of countries which form the units for imputation. We have used cross-classification of detailed subregions and income groups to define 49 domains for this purpose. Considering total, male and female separately, we have a total of 49x3=147 domains each containing one or more countries (see Annex C).

4. For each domain which has at least one country with data available, the ratio of the above two sums over countries with available data gives an estimate of the average ratio in the domain, say

$[Y/X]_{av} = sum(Y_{INPUT})/sum(X_{Y=INPUT})$.

5. For a domain which has no countries with information on the required ratio [Y/X], we have to "borrow" the average value $[Y/X]_{av}$ from a "neighbouring" domain. Ideally, a neighbouring domain is taken to be a domain in the same detailed subregion but in an adjacent income group. When that is not possible (i.e. no such neighbour is available), we have to search in a neighbouring detailed subregion, and in exceptional circumstances, even in a neighbouring broad subregion. Sometimes the choice requires subjective judgement, such as when the data in the closest available neighbouring domain are based only on a small number of cases and therefore cannot be taken as reliable.

6. With $[Y/X]_{av}$ so constructed for every domain, ratio $[Y/X]_{IMPUTED}$ can be constructed for every case (country-by-sex):

$[Y/X]_{IMPUTED} = [Y/X]_{INPUT}$ where the latter is available; otherwise

$[Y/X]_{IMPUTED} = [Y/X]_{av}$ for the domain to which the case belongs.

7. Finally, the values $Y_{IMPUTED}$ estimated for each case

$Y_{IMPUTED} = X * [Y/X]_{IMPUTED}$

are summed to the level of any reporting domain as required. "Reporting domain" may refer, for instance, to income groups, and/or to major regions, broad subregions or detailed subregions.

6.4 Constructing variable MW, migrant workers

6.4.1 Countries with available data on MW

Availability of data for a given country means that data were found on migrant workers from a population census or national labour force survey or other large-scale representative household surveys with a reference year not earlier than 2005. In a few exceptions, countries for which the data found on migrant workers were earlier than 2005 were also accepted. In terms of the notation introduced in table 6.1, to be considered "available" the data on migrant workers must include MW and either W or M from the same source and the same reference year, such that we can calculate one or the other of the two ratios: [MW/W], migrant workers as a proportion of the total labour force; or [MW/M], the share of migrant workers in total working-age migrant population. In most cases, the available data on migrant workers referred to employed migrants and excluded unemployed migrants. They were nevertheless used in the calculations.

The estimation of migrant workers for 2013 for countries for which data on migrant workers were available in the sense described above was calculated as follows:

$MW_{INPUT} = M * [MW/M]_{INPUT}$.

The notation introduced in section 6.3: $[MW/M]_{INPUT}$ is migrants' labour force participation rate (or proportion working) where this information is available in national input data, and M is the number of migrants known from the benchmark data.

In cases where the available data was in the form of [MW/W], the data was converted into [MW/M] using the benchmark data on working-age migrants M and national labour force W, actually their ratio (W/M):

$[MW/M]_{INPUT} = (W/M) * [MW/W]_{INPUT}$.

For countries for which both ratios [MW/M] and [MW/W] were available, the first ratio [MW/M] was used unless the country data on MW referred to the desired concept of migrant labour force as opposed to employed migrants. Indeed, this was the case for almost all OECD countries for which data on unemployed migrants as well as employed migrants were available.

Normally the ratio [MW/M] is preferable because it is more stable (uniform) across countries than ratio [MW/W].

6.4.2 Countries with missing data on MW

For cases (countries-by-sex) with data available we have

$MW_{INPUT} = M * [MW/M]_{INPUT}$

and the quantities MW_{INPUT} and $M_{MW=INPUT}$ are summed over the domain. For each domain which has at least one case with data available, the ratio of the above two sums over cases with available data gives an estimate of the average ratio in the domain:

$[MW/M]_{av} = sum(MW_{INPUT})/sum(M_{MW=INPUT})$.

For a domain which has no country with information on the required ratio [MW/M], we borrow the average value $[MW/M]_{av}$ from a neighbouring domain. Hence we can construct for every case (country-by-sex):

$[MW/M]_{IMPUTED} = [MW/M]_{INPUT}$ where the latter is available; otherwise

$[MW/M]_{IMPUTED} = [MW/M]_{av}$ for the domain of the country. This gives

$MW_{IMPUTED} = M * [MW/M]_{IMPUTED}$,

quantities which can be summed up to the level of reporting domains as required.

6.4.3 Some details

The actual algorithm involves some details which are worth noting.

(i) For each country, the quantity MW_{INPUT} defined above is computed for the total (male+female) population and for males and females separately. Let us call these three respectively T1, M1 and F1. In terms of data availability, logically there are five possible patterns: all three of the above quantities are available, only one of the three quantities (T1 or M1 or F1) is available, or none of them is available. In the present application, the situation was found to be as follows. Of the 176 countries, full information was available in 84, partial (only on T1 or M1 or F1) in 27, and none in 65 countries.

(ii) The 84 "full information" countries included four countries where two of the three quantities (T1, M1, F1) were recorded. All three could be completed using the relationship T1 = M1 + F1. Let us call the quantities resulting after this simple step T2, M2 and F2.

(iii) Estimates are improved using the following relationships (already noted in section 6.2) which ensure that the resulting T3 = M3 + F3:

T3 = max (T2, M2+F2)
M3 = M2 * T3/(M2+F2)
F3 = F2 * T3/(M2+F2)

(iv) For male and female separately, the condition is imposed that MW does not exceed the corresponding M (number of migrants) values, M-male and M-female.

M4 = min (M3, M-male) [29]
F4 = min (F3, M-female).

Finally, T4 is computed to be consistent with the above:

T4 = M4 + F4.

The next step is to impute for missing values of [MW/M] using the procedure described earlier.

In carrying out this imputation separately for total (T), male (M) and female (F), it is important to note the following point so as to ensure consistency.

Imputation is made to ensure that for each country, at least two of the three values (T, M, F) become available. For consistency, *at most two* values are imputed (never all three T, M, F) – if there is a remaining unimputed value it is obtained from the other two using the relationship T=M+F. Preferred order of imputation where values are missing is F, then M, and only then T as needed.

(v) The fifth improved version of MW is constructed with the objective of using any information on [MW/M] so far unused.

F5 = F4 if already available;
else F5 = M*[MW/M] for female if the latter is available;
else F5 remains blank.

29 In general, symbol M refers to the number of migrants, with M-male and M-female distinguishing it by sex when necessary. Total, male and female for any variable have been referred to as Tn, Mn and Fn respectively, n=1,2,3 … indicating successive refinements of the numbers.

M5 = M4 if already available;
else M5 = M*[MW/M] for male if the latter is available;
else M5 remains blank.

T5 = M5 + F5 if both available from the above;
else T5 = T4 if already available;
else T5 = M*[MW/M] for total if the latter is available;
else T5 remains blank.

(vi) The next steps give MW values by country and sex, with all information completed. The objective is to fill any gaps by using the relationship T6 = M6 + F6.

In the present application, such gaps existed only in M6; these were filled using

M6 = T6 - F6, with T6 = T5, F6 =F5.

(vii) The obvious requirement that the number of migrant workers does not exceed the total number of workers in any country and sex group

$MW \leq W$

has not been introduced so far because all the input data were in the form [MW/M], which gave estimates of MW as MW= M*[MW/M], without making any reference to W.

In fact, the error MW>W happened to be rare and negligibly small – 115 out of 150,368 (thousands), i.e. 0.07 per cent overall.[30] In the final step this contradiction was simply removed as follows.

M7 = min (M6, W-male)

F7 = min (F6, W-female)

T7 = M7 + F7.

30 This happened in three cases, all for the female group: Jordan MW=473, W=382; Bahrain MW=152, W=146; Qatar MW=206 W=188.

6.5 Constructing variable MW(sec), migrant workers by sector

This refers to the breakdown of MW (by country and sex) according to main sector: agriculture (AGR), industry (IND) and services (SRV).

The original input data contained a number of obvious errors (e.g. repeated but different figures for the same country in a few cases, some figures in single numbers rather than in thousands as elsewhere). These errors were corrected when identified. However, the input numbers still lacked consistency in many cases, for instance:

MW (overall and/or by sector) for "male" and "female" did not add up to the value specified for MW "total" in some cases.

In cases where MW was available in the input data, it did not necessarily equal the sum of given values of MW by sector, MW(AGR) + MW(IND) + MW(SRV).

In some other cases, the above given sum did not agree with (and sometimes differed widely from) the MW values estimated after imputation in section 6.4.

It was not considered necessary to try and correct such errors individually. Instead, the following procedure was used to produce consistent results.

6.5.1 Countries with available data on MW(sec)

(i) The given numbers for MW(AGR), MW(IND) and MW(SRV) were used to construct percentage distribution of MW by sector. Defining

MW(sum) = MW(AGR) + MW(IND) + MW(SRV)

the distribution is [MW(AGR)/MW(sum)], [MW(IND)/MW(sum)] and [MW(SRV)/MW(sum)].

(ii) The percentage distribution values are multiplied by the final MW values obtained in section 6.4 to obtain corrected counts by sector:[31]

31 Note that following the imputation described in section 6.4, MW is now taken as available for countries by sex. More precisely, the following expressions should have been written as $MW(AGR)_{INPUT} = MW_{IMPUTED} * [MW(AGR)/MW(sum)]_{INPUT,}$ etc.

The subscripts have been left out for simplicity when not necessary.

MW(AGR) = MW * [MW(AGR)/MW(sum)]
MW(IND) = MW * [MW(IND)/MW(sum)]
MW(SRV) = MW * [MW(SRV)/MW(sum)].

The above is done only for "male" and "female" at this stage; results for "total" will be obtained subsequently by adding these two components.

At this stage, the above is done only for countries where distribution of MW by sector is available.

(iii) The next step is to impute for missing values of [MW(sec)/MW] using the procedure described earlier. The imputation procedure is applied separately for "male" and "female". It is important to note that, in order to ensure consistency, such imputation is not made for "total" in its own right. It is possible to follow this procedure because, in the present application, in cases where information was available on MW(sec) it was always available with breakdown by sex.

6.5.2 Countries with missing data on MW(sec)

(i) For countries with data available we have $MW(sec)_{INPUT} = MW * [MW(sec)/MW]_{INPUT}$, and the quantities $MW(sec)_{INPUT}$ and $MW_{MW(sec)=INPUT}$ are summed over the domain. To remind about the notation used : $MW(sec)_{INPUT}$ refers to a case where MW(sec) value is known or can be computed from input data; $MW_{MW(sec)=INPUT}$ refers to MW value of such a case.

For each domain which has at least one country with data available, the ratio of the above two sums over countries with available data gives an estimate of the average distribution by sector in the domain: $[MW(sec)/MW]_{av} = sum(MW(sec)_{INPUT})/sum(MW_{MW(sec)=INPUT})$.

(ii) For a domain which has no country with information on the required distribution [MW(sec)/MW], we borrow the average value $[MW(sec)/MW]_{av}$ from a neighbouring domain. Hence we can construct for every case (country-by-sex):

$$[MW(sec)/MW]_{IMPUTED} = [MW(sec)/MW]_{INPUT}$$

where the latter is available; otherwise

$$[MW(sec)/MW]_{IMPUTED} = [MW(sec)/MW]_{av}$$

for the domain of the country. This gives

$$MW(sec)_{IMPUTED} = MW * [MW(sec)/MW]_{IMPUTED},$$

quantities which can be summed to the level of reporting domains as required.

(iii) Finally, the distribution by country, for male and female separately, are multiplied by the corresponding final MW values to obtain counts by sector. The male and female panels are added up to obtain counts in the total panel, which are then converted into percentage distributions.

6.6 Constructing variable D, number of domestic workers

The estimation of domestic workers involves two related steps: (a) estimation of all domestic workers; and (b) estimation of migrant domestic workers. In each case the estimation was carried out for males and females separately.

This section considers the step of estimating the number of domestic workers. The methodology for estimating domestic workers by sex follows essentially the same reasoning as the methodology described for migrant workers.

(i) For countries with data available we have $D_{INPUT} = W * [D/W]_{INPUT}$.

(ii) In order to obtain domain averages for D/W, we use the combined ratio estimator. Quantities D_{INPUT} and $W_{D=INPUT}$ are summed over the domain. For each domain which has at least one country with data available, the ratio of the above two sums over countries with available data gives an estimate of the average ratio in the domain:

$$[D/W]_{av} = sum(D_{INPUT})/sum(W_{D=INPUT}).$$

(iii) For a domain which has no country with information on the required ratio [D/W], we borrow the average value $[D/W]_{av}$ from a neighbouring domain. Hence we can construct for every case (country, separately for male and female):[32]

$$[D/W]_{IMPUTED} = [D/W]_{INPUT}$$

where the latter is available; otherwise

32 For consistency, this is done only for males and females, but not for total in its own right. Values for total are obtained by addition; see the next step.

$[D/W]_{IMPUTED} = [D/W]_{av}$

for the domain of the country. This gives

$D_{IMPUTED} = W * [D/W]_{IMPUTED}$,

quantities which can be summed to the level of reporting domains as required.

(iv) Let us write the D values by country obtained for male and female separately as M1 and F1, respectively. These are added to obtain counts in the total (male + female): T1 = M1 + F1.

(v) It seemed that the given values of D in some cases were too low in a number of countries in comparison with MD values. Consequently, in some (16 of the 176) countries there arose a small error in satisfying the requirement that the number of domestic workers must be at least as large as the number of migrant domestic workers (the latter estimated as described in the next section). There was some pattern to this: half of these countries were from Eastern Europe and CIS, and a fourth from Eastern and South-Eastern Asia. We have introduced a correction to the estimated D values, in that they cannot be smaller than the *final estimated* MD in the same country, described in the next section. The estimates were corrected as follows.

T2 = max (MD-total, T1)

M2 = max (MD-male, M1)

F2 = max (MD-female, F1).

(vi) Finally, it is ensured that male and female add up to total:

T3 = max (T2, M2+F2)
M3 = M2 * T3/(M2+F2)
F3 = F2 * T3/(M2+F2)

6.7 Constructing variable MD, number of migrant domestic workers

(i) Let us first consider countries for which data on migrant domestic workers are available. Data availability means the existence of national data on migrant workers such that either of the ratios

share of migrant domestic workers among domestic workers [MD/D]

share of migrant domestic workers among migrant workers [MD/MW]

can be calculated for the same source and the same reference year.

In order to use ratio [MD/D] where available, it was also necessary to have information on D available. Though in principle one could use the values of D constructed as in section 6.6, it was decided only to use D_{INPUT}, i.e. values given in the original input dataset. This was a precaution in view of some shortcomings of data on D, as noted earlier. In any case, there were few cases with no data on D_{INPUT} when $[MD/D]_{INPUT}$ was available.

In cases where only [MD/D] (and D) but no [MD/MW] was available, total MD was estimated as

$MD_{INPUT} = MD_{from\ D} = D_{INPUT} * [MD/D]_{INPUT}$.

In cases where only [MD/MW] but no [MD/D] was available, total MD was estimated as

$MD_{INPUT} = MD_{from\ MW} = MW * [MD/MW]_{INPUT}$.[33]

In cases where the data permitted the calculation of both ratios, after some experimentation it was decided to retain the ratio that provided a higher estimate of migrant domestic workers:

$MD_{INPUT} = \max (MD_{from\ D,}\ MD_{from\ M})$.

(ii) The first estimate of MD was obtained by adjusting the above so as not to exceed the already estimated number of migrant workers in the service sector (section 6.5):

$MD1 = \min (MD_{INPUT},\ MW(SRV))$.[34]

33 Note that, again, MW here refers to the final estimate for MW, i.e. to $MW_{IMPUTED}$, rather than only to the originally available values MW_{INPUT}. This differs from the use of D_{INPUT} in the alternative estimate $MD_{from\ D}$ given above.

34 Note that we have not introduced here the constraint that the number of migrant domestic workers, MD, cannot exceed D, the total number of domestic workers. As already noted, this is because of certain shortcomings in data on D. Rather, the constraint has been applied in reverse as noted in the construction of D, namely that D cannot be less than MD; if so, the given data on D was revised upwards.
The same applies to the final estimates after imputation. If the estimate of MD exceeded that of D, then the former was not adjusted downwards; rather the latter was adjusted upwards so as not to be less than estimated MD at the countryX sex level.

The above, done for "total", is repeated for "male" and "female" in turn. Let us denote these three estimates as T1, M1 and F1, respectively

(iii) The above estimates are adjusted to ensure that male and female sum to the total estimate:

$$T2 = \max(T1, M1+F1)$$
$$M2 = M1 * T2/(M1+F1)$$
$$F2 = F1 * T2/(M1+F1)$$

(iv) We recheck that for males and females the estimates do not exceed the corresponding MW(SRV):

$M3 = \min(M2, MW(SRV)_{MALE})$
$F3 = \min(F2, MW(SRV)_{FEMALE})$,

and recompute "total" as

$T3 = M3 + F3$.

(v) For cases for which F3 is available, we compute the ratio [F3/T3], proportion female among migrant domestic workers.[35]

Now the standard imputation procedure is used to estimate the ratio [F3/T3] for all countries.

Where available, quantities F3 and T3 are summed over each domain. For each domain which has at least one country with data available, the ratio of the above two sums over countries with available data gives an estimate of the average proportion of females in the domain:

$[F3/T3]_{av} = sum(F3)/sum(T3)$.

For a domain which has no country with information on the required ratio [F3/T3], we borrow the average value $[F3/T3]_{av}$ from a neighbouring domain. Hence we can construct for every country:

$[F3/T3]_{IMPUTED} = [F3/T3]_{INPUT}$

where the latter is available; otherwise

$[F3/T3]_{IMPUTED} = [F3/T3]_{av}$

for the domain of the country.

(vi) Next, starting with cases where ratio

$[MD/MW]_{INPUT}$

is available, the standard imputation procedure is followed to construct ratio

$[MD/MW]_{IMPUTED}$

for all countries. This is done for total and for female in turn.[36]

(vii) An improved MD value for female (say, F4), is computed as follows:

F4 = F3 if F3 is already available; otherwise

if T3 is available, then $F4 = T3*[F3/T3]_{IMPUTED}$, otherwise

if T3 is also not available, then $F4 = MW_{FEMALE} * [MD/MW]_{IMPUTED-FEMALE}$.

(viii) The value is adjusted to ensure that F4 does not exceed $MW(SRV)_{FEMALE}$.

$F5 = \min(F4, MW(SRV)_{FEMALE})$.

(ix) An improved MD value for (male+female) = total (say, T4), is computed as follows:

T4 = T3 if T3 is already available; otherwise:

$T4 = F5/[F3/T3]_{IMPUTED}$, where F5 has been computed in (viii) and the denominator $[F3/T3]_{IMPUTED}$ has been computed in (vi) above.

(x) The value is adjusted to ensure that T4 does not exceed $MW(SRV)_{TOTAL:}$

$T5 = \min(T4, MW(SRV)_{TOTAL})$.

(xi) An improved MD value for male (say, M5), is computed as:

$M5 = T5 – F5$.

35 The procedure has been made simpler at this point by the fact that, in the present data, in all cases where F3 is available, T3 also happens to be available. Modification (elaboration) would be required for a dataset containing cases with F3 available but T3 missing.

36 The reason for choosing "female" rather than "male" for this operation is that domestic labour and especially migrant domestic labour tends to be predominantly female.

(xii) An alternative estimate for MD-total is:

$T6 = MW_{TOTAL} * [MD/MW]_{IMPUTED\text{-}TOTAL}$

and the larger of the two estimates is taken:

T7 = max(T5, T6).

T6 exceeding the original T5 happens in a minority of the cases (37 out of 176 countries).

(xiii) Estimate for female is adjusted proportionately:

F7 = F5 * (T7 / T5)

and estimate for male is obtained by difference:

M7 = T7 – F7.[37]

(xiv) The above adjustments can result in violating the constraint MD≤MW(SRV) imposed earlier. This in fact happened in the present application in some countries, all of which happen to be in Eastern Asia, and in all cases the violation concerned the female subpopulation.[38] Though this error is rare and mostly negligibly small, it needs to be corrected:

$T8 = \min(T7, MW(SRV)_{TOTAL})$; $F8 = \min(F7, MW(SRV)_{FEMALE})$; M8 = T8 – F8.

37 Note that for males, computation of quantities M4 and M6 is not involved in the above procedure.

38 Since in the present application this error happen to occur only for female (F), the correction has simply meant transferring the "excess" MW from F in cases with error to male (M) in the same country, leaving total (T) unchanged.

ANNEXES

Annex A

Geographical regions and income groups

Countries and territories have been grouped into four classes according to income level as follows:

TABLE **A.1**

Income groups		No. of countries
1	Low income	30
2	Lower-middle income	44
3	Upper-middle income	44
4	High income	58
	Total	**176**

TABLE **A.1.1**

Income group	No. of countries	Countries
Low income	30	Afghanistan
		Benin
		Burkina Faso
		Burundi
		Cambodia
		Central African Rep.
		Chad
		Comoros
		Congo, Dem. Rep.
		Eritrea
		Ethiopia
		Gambia
		Guinea
		Guinea-Bissau
		Haiti
		Korea, DPR
		Liberia
		Madagascar
		Malawi
		Mali
		Mozambique
		Nepal
		Niger
		Rwanda
		Sierra Leone
		Somalia
		Tanzania, United Rep.
		Togo
		Uganda
		Zimbabwe
Lower-middle income	44	Armenia
		Bangladesh
		Bhutan
		Bolivia, Plurinational State of
		Cameroon
		Cabo Verde
		Congo
		Côte d'Ivoire
		Egypt
		El Salvador
		Georgia
		Ghana
		Guatemala
		Guyana
		Honduras
		India
		Indonesia
		Kenya
		Kyrgyzstan

Income group	No. of countries	Countries
		Lao PDR
		Lesotho
		Mauritania
		Moldova, Rep. of
		Morocco
		Myanmar
		Nicaragua
		Nigeria
		Occupied Palestinian Territory
		Pakistan
		Papua New Guinea
		Philippines
		Senegal
		Solomon Islands
		Sri Lanka
		Sudan
		Swaziland
		Syrian Arab Rep.
		Tajikistan
		Timor-Leste
		Ukraine
		Uzbekistan
		Viet Nam
		Yemen
		Zambia
Upper-middle income	44	Albania
		Algeria
		Angola
		Azerbaijan
		Belarus
		Belize
		Bosnia and Herzegovina
		Botswana
		Brazil
		Bulgaria
		China
		Colombia
		Costa Rica
		Cuba
		Dominican Rep.
		Ecuador
		Fiji
		Gabon
		Guadeloupe
		Iran, Islamic Rep.
		Iraq
		Jamaica
		Jordan
		Kazakhstan
		Lebanon
		Libya
		Macedonia, The Former Yugoslav Rep.
		Malaysia
		Maldives
		Mauritius
		Mexico
		Mongolia
		Namibia
		Panama
		Paraguay
		Peru
		Romania
		Serbia
		South Africa
		Suriname

Income group	No. of countries	Countries
		Thailand
		Tunisia
		Turkey
		Turkmenistan
High income	58	Argentina
		Australia
		Austria
		Bahamas
		Bahrain
		Barbados
		Belgium
		Brunei Darussalam
		Canada
		Chile
		Croatia
		Cyprus
		Czech Rep.
		Denmark
		Equatorial Guinea
		Estonia
		Finland
		France
		Germany
		Greece
		Hong Kong, China
		Hungary
		Iceland
		Ireland
		Israel
		Italy
		Japan
		Korea, Rep.
		Kuwait
		Latvia
		Lithuania
		Luxembourg
		Macau, China
		Malta
		Martinique
		Netherlands
		New Zealand
		Norway
		Oman
		Poland
		Portugal
		Puerto Rico
		Qatar
		Réunion
		Russian Federation
		Saudi Arabia
		Singapore
		Slovakia
		Slovenia
		Spain
		Sweden
		Switzerland
		Trinidad and Tobago
		United Arab Emirates
		United Kingdom
		United States
		Uruguay
		Venezuela, Bolivarian Rep.
Total	**176**	

For the purpose of this report the world has been divided into standard geographical regions with three levels of detail: five major regions and 11 broad subregions, further divided into 20 finer subregions as follows.

TABLE **A.2**

Standard geographical regions		
1 Africa		
11	Northern Africa	
	111	Northern Africa
12	Sub-Saharan Africa	
	121	Central Africa
	122	Eastern Africa
	123	Southern Africa
	124	Western Africa
2 Americas		
21	Latin America and the Caribbean	
	211	Caribbean
	212	Central America
	213	South America
22	Northern America	
	221	Northern America
3 Europe & Central Asia		
31	Northern, Southern and Western Europe	
	311	Northern Europe
	312	Southern Europe
	313	Western Europe
32	Eastern Europe	
	321	Eastern Europe
33	Central and Western Asia	
	331	Central and Western Asia
4 Arab States		
41	Arab States	
	411	Arab States
5 Asia & the Pacific		
51	Eastern Asia	
	511	Eastern Asia
52	South-Eastern Asia and the Pacific	
	521	South-Eastern Asia
	522	Australia and New Zealand
	523	Pacific Islands
53	Southern Asia	
	531	Southern Asia

TABLE **A.3**

Number of countries in each major region		
	Major regions	**No. of countries**
1	Africa	51
2	Americas	32
3	Europe & Central Asia	49
4	Arab States	12
5	Asia & the Pacific	32
	Total	**176**

TABLE **A.4**

Number of countries in each broad subregion		
	Broad subregions	**No. of countries**
11	Northern Africa	6
12	Sub-Saharan Africa	45
21	Latin America and the Caribbean	30
22	Northern America	2
31	Northern, Southern and Western Europe	28
32	Eastern Europe	10
33	Central and Western Asia	11
41	Arab States	12
51	Eastern Asia	7
52	South-Eastern Asia and the Pacific	16
53	Southern Asia	9
	Total	176

TABLE **A.4.1**

Broad subregion	No. of countries	Countries
11 Northern Africa	**6**	Algeria
		Egypt
		Libya
		Morocco
		Sudan
		Tunisia
12 Sub-Saharan Africa	**45**	Angola
		Benin
		Botswana
		Burkina Faso
		Burundi
		Cameroon
		Cabo Verde
		Central African Rep.
		Chad
		Comoros
		Congo
		Congo, DR
		Côte d'Ivoire
		Equatorial Guinea
		Eritrea
		Ethiopia
		Gabon
		Gambia
		Ghana
		Guinea
		Guinea-Bissau
		Kenya
		Lesotho
		Liberia
		Madagascar
		Malawi
		Mali
		Mauritania
		Mauritius
		Mozambique
		Namibia
		Niger
		Nigeria
		Réunion
		Rwanda
		Senegal
		Sierra Leone
		Somalia
		South Africa
		Swaziland
		Tanzania, United Rep.
		Togo
		Uganda
		Zambia
		Zimbabwe
21 Latin America and the Caribbean	**30**	Argentina
		Bahamas
		Barbados
		Belize
		Bolivia, Plurinational State of
		Brazil
		Chile
		Colombia
		Costa Rica
		Cuba
		Dominican Rep.
		Ecuador
		El Salvador
		Guadeloupe

		Guatemala
		Guyana
		Haiti
		Honduras
		Jamaica
		Martinique
		Mexico
		Nicaragua
		Panama
		Paraguay
		Peru
		Puerto Rico
		Suriname
		Trinidad and Tobago
		Uruguay
		Venezuela, Bolivarian Rep.
22	**Northern America**	**2**	Canada
			United States
31	**Northern, Southern and Western Europe**	**28**	Albania
			Austria
			Belgium
			Bosnia and Herzegovina
			Croatia
			Denmark
			Estonia
			Finland
			France
			Germany
			Greece
			Iceland
			Ireland
			Italy
			Latvia
			Lithuania
			Luxembourg
			Macedonia, The Former Yugoslav Rep.
			Malta
			Netherlands
			Norway
			Portugal
			Serbia
			Slovenia
			Spain
			Sweden
			Switzerland
			United Kingdom
32	**Eastern Europe**	**10**	Belarus
			Bulgaria
			Czech Rep.
			Hungary
			Moldova, Rep.
			Poland
			Romania
			Russian Federation
			Slovakia
			Ukraine
33	**Central and Western Asia**	**11**	Armenia
			Azerbaijan
			Cyprus
			Georgia
			Israel
			Kazakhstan
			Kyrgyzstan
			Tajikistan
			Turkey

			Turkmenistan
			Uzbekistan
41	Arab States	12	Bahrain
			Iraq
			Jordan
			Kuwait
			Lebanon
			Occupied Palestinian Territory
			Oman
			Qatar
			Saudi Arabia
			Syrian Arab Rep.
			United Arab Emirates
			Yemen
51	Eastern Asia	7	China
			Hong Kong, China
			Japan
			Korea, DPR
			Korea, Rep.
			Macau, China
			Mongolia
52	South-Eastern Asia and the Pacific	16	Australia
			Brunei Darussalam
			Cambodia
			Fiji
			Indonesia
			Lao PDR
			Malaysia
			Myanmar
			New Zealand
			Papua New Guinea
			Philippines
			Singapore
			Solomon Islands
			Thailand
			Timor-Leste
			Viet Nam
53	Southern Asia	9	Afghanistan
			Bangladesh
			Bhutan
			India
			Iran, Islamic Rep.
			Maldives
			Nepal
			Pakistan
			Sri Lanka
	Total	176	

TABLE **A.5**

Number of countries in each detailed subregion		
	Detailed subregions	**No. of countries**
111	Northern Africa	6
121	Central Africa	8
122	Eastern Africa	16
123	Southern Africa	5
124	Western Africa	16
211	Caribbean	10
212	Central America	8
213	South America	12
221	Northern America	2
311	Northern Europe	10
312	Southern Europe	11
313	Western Europe	7
321	Eastern Europe	10
331	Central and Western Asia	11
411	Arab States	12
511	Eastern Asia	7
521	South-Eastern Asia	11
522	Australia and New Zealand	2
523	Pacific Islands	3
531	Southern Asia	9
	Total	**176**

Results are presented for four income groups (low income, lower-middle income, upper-middle income and high income) at the global level, and at the level of the 11 broad subregions.

Some results are also discussed by cross-classifying income groups and broad subregions. Ignoring empty and very small cells, there are 22 categories in this cross-classification.

All results are shown for the total population, and for male and female populations separately.

The estimation procedure used involved the construction of measures by individual country (for the 176 countries included in the database), and by 49 detailed country groups (domains) formed by cross-classification of detailed subregions and income groups. These results formed the "building blocks" of the estimation procedure used, but they are considered too detailed to be included in this report. These detailed results are available at the ILO for internal use.

Annex B

Cross-classification of geographical regions and income groups

Geographical regions and groups of countries by income level are highly correlated. In some regions, such as Northern America and Northern, Southern and Western Europe, all or nearly all countries are in the high income group, while in others such as Sub-Saharan Africa a majority of countries are in the low income group. Similarly, in Southern Asia the lower-middle income group predominates.

Table B.1 shows how the 176 countries included in the present analysis are distributed according to broad subregion and income group. Out of the possible 11x4=44 cells of the cross-classification, 12 cells have no countries in them.

Number of countries is however not a good measure of the size or "importance" of a cell in the cross-classification. In the study of workers, the total labour force or number of workers in a cell is an appropriate measure of its size. The first panel of table B.2 shows this number. In addition to 12 empty cells as already noted (dark shaded in the table), there are five cells with under five million workers (light shaded), and another five with under 10 million (under 0.3 per cent of the total) workers. Excluding these empty or very small cells, we are left with 22 (i.e. half the potentially possible 44) groups of countries. Two of the cells are very large: region 53, income level 2 (which includes India); and region 51, income level 3 (which includes China). There are only four other regions with over 200 million workers.

TABLE **B.1**

Number of countries by broad subregion and income group

	Number of countries				
	Income group				
Subregion	1	2	3	4	All
11 Northern Africa		3	3		6
12 Sub-Saharan Africa	25	12	6	2	45
21 Latin America and the Caribbean	1	6	14	9	30
22 Northern America				2	2
31 Northern, Southern and Western Europe			4	24	28
32 Eastern Europe		2	3	5	10
33 Central and Western Asia		5	4	2	11
41 Arab States		3	3	6	12
51 Eastern Asia	1		2	4	7
52 South-Eastern Asia and the Pacific	1	8	3	4	16
53 Southern Asia	2	5	2		9
Total	**30**	**44**	**44**	**58**	**176**

TABLE **B.2**

Size of the labour force, migrant workers and migrant domestic workers, by broad subregion and income group, 2013

TOTAL (M+F)

	W (total number of workers, millions)					MW/W (Migrant workers as % of all workers)					MD/MW (Migrant domestic workers as % of all migrant workers)				
	Income group					Income group					Income group				
Subregion	1	2	3	4	All	1	2	3	4	All	1	2	3	4	All
11		52	19		71		0.6	2.5		1.1		9.0	9.0		9.0
12	209	116	31	1	357	1.3	2.9	5.7	8.6	2.2	15.5	1.4	6.1	2.1	7.3
21	4	20	228	46	299	0.3	0.9	0.8	5.2	1.5	4.2	7.5	9.9	23.2	17.2
22				183	183				20.2	20.2				1.7	1.7
31			8	210	218			6.8	16.8	16.4			17.0	6.0	6.2
32		24	18	107	150		17.0	4.8	8.2	9.2		0.4	0.4	0.7	0.6
33		23	44	4	70		5.3	9.8	41.1	10.0		10.5	2.1	2.6	3.6
41		14	12	23	50		3.8	15.8	66.5	35.6		2.2	16.1	18.7	17.9
51	15		853	95	963	0.2		0.1	5.0	0.6	1.9		8.7	22.1	20.4
52	9	256	53	18	335	0.7	0.2	7.8	39.9	3.5	1.7	26.2	7.5	25.4	19.0
53	23	645	27		695	3.0	1.0	4.5		1.3	8.8	5.5	0.5		5.0
Total	**260**	**1 150**	**1 293**	**687**	**3 390**	**1.4**	**1.5**	**1.4**	**16.3**	**4.4**	**13.8**	**4.2**	**6.8**	**8.1**	**7.7**

Notes: * Data not shown for confidentiality reasons, since the cell contains only a single country. Shaded cells are empty (dark shaded) or are small in size (light shaded). For names of subregions corresponding to the code in the first column, see table B.1.

Table B.2 provides three statistics by broad subregion and income group:

(1) The total number of workers (W) in countries in the cell, in millions

(2) Proportion of migrants among the workers (MW/W)

(3) Migrant domestic workers as a proportion of all migrant workers (MD/MW)

The total number of migrant workers can be obtained by multiplying (1) and (2). The number of migrant domestic workers is obtained by multiplying all three, (1)*(2)*(3).

In some groups a very large proportion of workers are migrants. The largest value of (MW/W), 67 per cent, is for cell 41-4 (i.e. broad subregion 41 (Arab States), income level 4) which is composed of Saudi Arabia and Gulf countries (Bahrain, Kuwait, Oman, Qatar, United Arab Emirates), where two out of every three workers in the group are migrants. Other high figures include: around 40 per cent in groups 52-4 (Australia, Brunei Darussalam, New Zealand, Singapore) and 33-4 (Cyprus, Israel); and 20 per cent in group 22-4 (Canada, United States).

At the other end of the spectrum, migrant workers are fewer than 1 per cent of all workers in many groups including the following: group 11-2 including Egypt, Morocco and Sudan; groups 21-2 and 21-3 which include Brazil, Mexico and many other countries of Latin America and the Caribbean; groups 51-1 and 51-3 covering China, Democratic People's Republic of Korea and Mongolia; and group 52-2 including Indonesia, Myanmar, Philippines, Viet Nam and other lower-middle income countries in South-Eastern Asia.

A high proportion (22-25 per cent) of migrant workers are domestic workers in high income countries in the broad subregions 21 (Argentina, Chile, Uruguay, Bolivarian Republic of Venezuela and richer Caribbean countries), 51 and 52 which include Australia, Japan, New Zealand, Republic of Korea, Singapore and some smaller countries. In group 52-2, 26 per cent of migrant workers are domestic workers; but as noted, in this group migrant workers form a very small proportion (0.2 per cent) of all workers.

Statistics on migrant workers and migrant domestic workers are shown separately for males and females in

TABLE **B.3**

Size of the male labour force, migrant workers and migrant domestic workers, by broad subregion and income group, 2013

MALE

	W (total number of workers, millions)					MW/W (Migrant workers as % of all workers)					MD/MW (Migrant domestic workers as % of all migrant workers)				
	Income group					Income group					Income group				
Subregion	1	2	3	4	All	1	2	3	4	All	1	2	3	4	All
11		38	15		53		0.5	2.4		1.0		3.8	3.3		3.5
12	109	65	17	0	192	1.4	3.0	6.7	8.3	2.4	13.2	1.1	4.1	2.1	5.8
21	2	12	132	28	174	0.3	0.9	0.7	4.8	1.4	2.2	2.3	2.2	3.0	2.6
22				98	98				20.0	20.0				0.3	0.3
31			5	115	119			4.5	15.6	15.2			6.9	1.8	1.9
32		12	10	56	78		18.0	4.9	6.4	8.0		0.0	0.0	0.6	0.3
33		13	28	2	43		4.0	6.9	29.3	7.1		10.8	0.8	0.7	2.5
41		11	10	19	41		3.9	14.0	68.0	36.8		0.0	4.1	11.4	10.4
51	8		475	55	537	0.2		0.1	3.9	0.5	0.0		1.5	5.0	4.5
52	4	148	30	10	192	0.8	0.2	8.1	39.1	3.4	0.0	15.0	1.2	3.6	3.2
53	14	472	22		508	1.3	0.8	5.3		1.0	26.0	7.7	0.4		6.7
Total	**138**	**772**	**743**	**382**	**2 035**	**1.3**	**1.2**	**1.4**	**16.3**	**4.1**	**14.1**	**4.4**	**2.0**	**3.5**	**3.7**

See notes to table B.2.

tables B.3 and B.4. There is little gender difference in the patterns of variation in the proportion of migrant workers to all workers (MW/W). However, the pattern of variation in the proportion of migrant domestic workers to all migrant workers (DW/MW) differs markedly for males and females.

For males, there are no cells with very high values for the proportion of domestic workers among migrant workers. The ratio (DW/MW) is below 10 per cent in all cells, except for four with values in the range 10-15 per cent, and a higher value in a very small cell. The last-mentioned is probably an outlier; it is cell 53-1 (Afghanistan, Nepal), where the total workforce W is small, as is the proportion of migrants in the workforce (small MW/W, and hence even smaller MW).

The cells with high values for the proportion of domestic workers among migrant workers (DW/MW) noted in table B.2 for the total (male+female) population therefore arise primarily from the even more sharp differences for female migrant workers.

Two-thirds of female migrant workers are domestic workers in the high income group in broad subregion 41 (Saudi Arabia and the Gulf countries Bahrain, Kuwait, Oman, Qatar, United Arab Emirates); while one in two female migrant workers are domestic workers in the high income group in broad subregions 21 (Argentina, Chile, Uruguay, Bolivarian Republic of Venezuela and richer Caribbean countries) and 52 (Australia, Brunei Darussalam, New Zealand, Singapore). Similar figures are also found in the upper-middle income group of region 41 (Iraq, Jordan, Lebanon), while over a third (36 per cent) of female migrant workers are domestic workers in the high income group in broad subregion 51 (Japan, Republic of Korea, and also Hong Kong (China) and Macau (China)).

Many more issues may be examined from the main results presented above. The commentary in this annex has aimed to highlight the main patterns observed concerning the number and characteristics of migrant workers and migrant domestic workers across the world.

TABLE **B.4**

Size of the female labour force, migrant workers and migrant domestic workers, by broad subregion and income group, 2013

FEMALE

	W (total number of workers, millions)					MW/W (Migrant workers as % of all workers)					MD/MW (Migrant domestic workers				
	Income group					Income group					Income group				
Subregion	1	2	3	4	All	1	2	3	4	All	1	2	3	4	All
11		14	4		18		0	0		1.2		0	0		23.0
12	100	51	14	0	165	1.2	2.7	4.5	9.0	2.0	18.4	1.7	9.7	2.2	9.4
21	2	8	96	19	125	0.2	1.0	0.8	5.8	1.6	8.2	14.4	19.7	47.8	35.3
22				85	85				20.6	20.6				3.3	3.3
31			4	95	99			9.8	18.2	17.9			23.3	10.3	10.6
32		12	8	51	72		15.9	4.8	10.3	10.6		0.8	0.8	0.8	0.8
33		9	16	2	27		7.0	14.9	54.8	14.8		10.2	3.2	3.7	4.5
41		3	2	3	9		3.5	23.2	58.0	30.0		11.2	47.6	67.0	60.8
51	7		378	40	426	0.2		0.1	6.4	0.7	3.7		16.5	36.1	33.9
52	4	108	23	8	144	0.6	0.1	7.3	40.8	3.6	3.7	52.9	16.3	50.6	39.2
53	9	173	5		187	5.7	1.8	1.1		2.0	2.8	2.8	2.8		2.8
Total	**123**	**378**	**550**	**304**	**1 356**	**1.5**	**2.0**	**1.3**	**16.5**	**4.9**	**13.5**	**4.0**	**13.7**	**13.8**	**12.7**

See notes to table B.2.

Annex C

Countries covered, by domain (cross-classification of detailed subregion and income group)

With 20 detailed subregions and four income groups, there are 20x4=80 cells in table C.1. Only 49 of those cells contain at least one country. Counting separately for total, male and female, this gives a maximum of 49x3=147 non-empty cells. These cells form the basic units for imputation of missing values on the variables. For certain suitably defined statistics, the average value is computed and then assigned to all countries in the cell with data missing on the variable concerned. For some variables, the cell may contain no countries with data available. In that case the mean value is taken from the "nearest" cell for which it is available.

The major regions, broad subregions and detailed subregions are as shown in Annex A.

TABLE **C.1**

Cross-classification of countries, by region, subregion and income group

Subregion				Income group												
Broad	Detailed		No. of countries	1	Low income		2	Lower-middle income		3	Upper-middle income		4	High income	
	Countries			Countries			Countries			Countries			Countries		
11	111	Northern Africa	6				3	Egypt	Sudan	3	Algeria	Tunisia			
								Morocco			Libya				
12	121	Central Africa	8	3	Central African Rep.	Chad	2	Cameroon	Congo	2	Angola	Gabon	1	Equatorial Guinea	
					Congo Dem. Rrep.										
	122	Eastern Africa	16	12	Burundi	Mozambique	2	Kenya	Zambia	1	Mauritius		1	Réunion	
					Comoros	Rwanda									
					Eritrea	Somalia									
					Ethiopia	Tanzania, United Rep.									
					Madagascar	Uganda									
					Malawi	Zimbabwe									
	123	Southern Africa	5				2	Lesotho	Swaziland	3	Botswana	South Africa			
											Namibia				
	124	Western Africa	16	10	Benin	Liberia	6	Cabo Verde	Mauritania						
					Burkina Faso	Mali		Côte d'Ivoire	Nigeria						
					Gambia	Niger		Ghana	Senegal						
					Guinea	Sierra Leone									
					Guinea-Bissau	Togo									
21	211	Caribbean	10	1	Haiti					4	Cuba	Guadeloupe	5	Bahamas	Puerto Rico
											Dominican Rep.	Jamaica		Barbados	Trinidad and Tobago
														Martinique	
	212	Central America	8				4	El Salvador	Honduras	4	Belize	Mexico			
								Guatemala	Nicaragua		Costa Rica	Panama			
	213	South America	12				2	Bolivia	Guyana	6	Brazil	Paraguay	4	Argentina	Uruguay
											Colombia	Peru		Chile	Venezuela, Bolivarian Rep.
											Ecuador	Suriname			

Subregion			No. of countries	Income group											
Broad	Detailed			1	Low income		2	Lower-middle income		3	Upper-middle income		4	High income	
	Countries			Countries			Countries			Countries			Countries		
22	221	Northern America	2										2	Canada	United States
31	311	Northern Europe	10										10	Denmark	Latvia
														Estonia	Lithuania
														Finland	Norway
														Iceland	Sweden
														Ireland	United Kingdom
	312	Southern Europe	7							2	Bosnia and Herzegovina	Serbia	5	Greece	Slovenia
														Italy	Spain
														Malta	
	313	Western Europe	7										7	Austria	Luxembourg
														Belgium	Netherlands
														France	Switzerland
														Germany	
32	321	Eastern Europe	10				2	Moldova, Rep. of	Ukraine	3	Belarus	Romania	5	Czech Rep.	Russian Federation
											Bulgaria			Hungary	
														Poland	Slovakia
33	331	Central and Western Asia	11				5	Armenia	Tajikistan	4	Azerbaijan	Turkey	2	Cyprus	Israel
								Georgia	Uzbekistan		Kazakhstan	Turkmenistan			
								Kyrgyzstan							
41	411	Arab States	12				3	Occupied Palestinian Territory	Yemen	3	Iraq	Lebanon	6	Bahrain	Qatar
								Syrian Arab Rep.			Jordan			Kuwait	Saudi Arabia
														Oman	United Arab Emirates
51	511	Eastern Asia	7	1	Korea, DPR					2	China	Mongolia	4	Hong Kong, China	Korea, Rep. of
														Japan	Macau, China
52	521	South-Eastern Asia	11	1	Cambodia		6	Indonesia	Philippines	2	Malaysia	Thailand	2	Brunei Darussalam	Singapore
								Lao PDR	Timor-Leste						
								Myanmar	Viet Nam						
	522	Australia and New Zealand	2										2	Australia	New Zealand
	523	Pacific Islands	3				2	Papua New Guinea	Solomon Islands	1	Fiji				
53	531	Southern Asia	9	2	Afghanistan	Nepal	5	Bangladesh	Pakistan	2	Iran, Islamic Rep.	Maldives			
								Bhutan	Sri Lanka						
								India							
Total			**176**	**30**			**44**			**44**			**58**		

Annex D

Data availability for different variables, by country and sex

Table D.1 shows whether (=1) or not (blank) input data on a particular variable were available. Information is provided for each of the 176 countries included in the present analysis, for total, male and female separately. The following four variables are covered.

Migrant workers	MW
Total domestic workers	D
Migrant domestic workers	MD
Migrant workers by main sector	MW (sector). Sectors include agriculture, industry and services

Full information for all the 176 countries is available from standard international sources on the three base variables:

Total population aged 15+	P
Migrant population aged 15+	M
Total workers	W

For each of the variables included, information is also provided on whether at least one data point is available, on total (T), or male (M), or female (F).

TABLE **D.1**

Data availabilty status for different variables, by country and sex

Domain code	Serial No.	Country	T	MWM	F	Any T, M or F	T	DM	F	Any T, M or F	T	MDM	F	Any T, M or F	Sector T	M	F	Any T, M or F	Total data points
1112	1	Egypt	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1112	2	Morocco	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1112	3	Sudan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1113	4	Algeria					1	1	1	1									3
1113	5	Libya																	0
1113	6	Tunisia																	0
1211	7	Central African Rep.																	0
1211	8	Chad																	0
1211	9	Congo, Dem. Rep.																	0
1212	10	Cameroon	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1212	11	Congo																	0
1213	12	Angola																	0
1213	13	Gabon																	0
1214	14	Equatorial Guinea																	0
1221	15	Burundi																	0

Domain code	Serial No.	Country	T	M W M	F	Any T, M or F	T	D M	F	Any T, M or F	T	M D M	F	Any T, M or F	Sector T	M	F	Any T, M or F	Total data points
1221	16	Comoros																	0
1221	17	Eritrea																	0
1221	18	Ethiopia					1	1	1	1									3
1221	19	Madagascar																	0
1221	20	Malawi	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1221	21	Mozambique																	0
1221	22	Rwanda	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1221	23	Somalia																	0
1221	24	Tanzania, United Rep.	1	1	1	1	1	1	1	1					1	1	1	1	9
1221	25	Uganda	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1221	26	Zimbabwe					1	1	1	1									3
1222	27	Kenya					1	1	1	1									3
1222	28	Zambia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1223	29	Mauritius					1	1	1	1									3
1224	30	Réunion																	0
1232	31	Lesotho					1	1	1	1									3
1232	32	Swaziland																	0
1233	33	Botswana	1	1		1	1	1	1	1									5
1233	34	Namibia					1	1	1	1									3
1233	35	South Africa	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1241	36	Benin																	0
1241	37	Burkina Faso	1	1	1	1	1	1	1	1									6
1241	38	Gambia																	0
1241	39	Guinea	1			1	1	1	1	1									4
1241	40	Guinea-Bissau																	0
1241	41	Liberia			1	1	1	1	1	1					1	1	1	1	7
1241	42	Mali	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1241	43	Niger																	0
1241	44	Sierra Leone	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1241	45	Togo																	0
1242	46	Cabo Verde																	0
1242	47	Côte d'Ivoire																	0
1242	48	Ghana	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
1242	49	Mauritania																	0

Domain code	Serial No.	Country	T	M W M	F	Any T, M or F	T	D M	F	Any T, M or F	T	M D M	F	Any T, M or F	Sector T	M	F	Any T, M or F	Total data points
1242	50	Nigeria	1			1	1	1	1	1									4
1242	51	Senegal	1			1	1	1	1	1									4
2111	52	Haiti	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2113	53	Cuba													1	1	1	1	3
2113	54	Dominican Rep.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2113	55	Guadeloupe																	0
2113	56	Jamaica	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2114	57	Bahamas					1	1	1	1									3
2114	58	Barbados																	0
2114	59	Martinique																	0
2114	60	Puerto Rico	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2114	61	Trinidad and Tobago						1		1									1
2122	62	El Salvador	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2122	63	Guatemala					1	1	1	1									3
2122	64	Honduras			1	1	1	1	1	1									4
2122	65	Nicaragua	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2123	66	Belize	1			1	1	1	1	1									4
2123	67	Costa Rica	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2123	68	Mexico	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2123	69	Panama	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2132	70	Bolivia, Plurinational State of	1	1	1	1	1	1	1	1	1	1	1	1					9
2132	71	Guyana					1	1	1	1									3
2133	72	Brazil	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2133	73	Colombia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2133	74	Ecuador	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2133	75	Paraguay					1	1	1	1									3
2133	76	Peru	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2133	77	Suriname																	0
2134	78	Argentina	1	1	1	1	1	1	1	1	1	1	1	1					9
2134	79	Chile	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
2134	80	Uruguay	1	1	1	1	1	1	1	1	1	1	1	1					9
2134	81	Venezuela, Bolivarian Rep.	1	1	1	1	1	1	1	1	1	1	1	1					9

Domain code	Serial No.	Country	T	M W M	F	Any T, M or F	T	D M	F	Any T, M or F	T	M D M	F	Any T, M or F	Sector T	M	F	Any T, M or F	Total data points
2214	82	Canada	1	1	1	1	1	1	1	1					1	1	1	1	9
2214	83	United States	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3114	84	Denmark	1	1	1	1	1	1	1	1	1	1	1	1					9
3114	85	Estonia	1	1	1	1													3
3114	86	Finland	1	1	1	1	1	1	1	1	1	1	1	1					9
3114	87	Iceland	1	1	1	1													3
3114	88	Ireland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3114	89	Latvia			1	1	1	1	1	1									4
3114	90	Lithuania	1			1	1	1	1	1									4
3114	91	Norway	1	1	1	1	1	1	1	1	1	1	1	1					9
3114	92	Sweden	1	1	1	1													3
3114	93	United Kingdom	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3123	94	Albania																	0
3123	95	Bosnia and Herzegovina																	0
3123	96	Macedonia, The Former Yugoslav Rep.					1	1	1	1									3
3123	97	Serbia			1	1	1	1	1	1									4
3124	98	Croatia			1	1	1	1	1	1									4
3124	99	Greece	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3124	100	Italy	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3124	101	Malta					1	1	1	1									3
3124	102	Portugal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3124	103	Slovenia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3124	104	Spain	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3134	105	Austria	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3134	106	Belgium	1	1	1	1	1	1	1	1	1	1	1	1					9
3134	107	France	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3134	108	Germany	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3134	109	Luxembourg	1	1	1	1	1	1	1	1	1	1	1	1					9
3134	110	Netherlands	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3134	111	Switzerland	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3212	112	Moldova, Rep.					1	1	1	1									3
3212	113	Ukraine	1			1													1
3213	114	Belarus																	0
3213	115	Bulgaria	1		1	1	1	1	1	1									5
3213	116	Romania	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3214	117	Czech Rep.	1	1	1	1	1	1	1	1	1	1	1	1					9

Domain code	Serial No.	Country	T	M W M	F	Any T, M or F	T	D M	F	Any T, M or F	T	M D M	F	Any T, M or F	Sector T	M	F	Any T, M or F	Total data points
3214	118	Hungary	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3214	119	Poland	1	1	1	1	1	1	1	1	1	1	1	1					9
3214	120	Russian Federation		1		1	1	1	1	1									4
3214	121	Slovakia	1	1	1	1	1	1	1	1	1	1	1	1					9
3312	122	Armenia		1		1	1	1	1	1									4
3312	123	Georgia	1		1	1	1	1	1	1									5
3312	124	Kyrgyzstan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3312	125	Tajikistan					1	1	1	1									3
3312	126	Uzbekistan																	0
3313	127	Azerbaijan			1	1	1	1	1	1									4
3313	128	Kazakhstan					1	1	1	1									3
3313	129	Turkey	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
3313	130	Turkmenistan																	0
3314	131	Cyprus					1	1	1	1									3
3314	132	Israel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
4112	133	Occupied Palestinian Territory	1	1	1	1	1	1	1	1	1	1	1	1					9
4112	134	Syrian Arab Rep.																	0
4112	135	Yemen	1			1	1	1	1	1	1	1	1	1					7
4113	136	Iraq	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
4113	137	Jordan	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
4113	138	Lebanon	1			1													1
4114	139	Bahrain	1	1	1	1	1	1	1	1	1	1	1	1					9
4114	140	Kuwait	1	1	1	1	1	1	1	1	1	1	1	1					9
4114	141	Oman	1	1	1	1	1	1	1	1	1	1	1	1					9
4114	142	Qatar	1	1	1	1	1	1	1	1	1	1	1	1					9
4114	143	Saudi Arabia	1	1	1	1	1	1	1	1	1	1	1	1					9
4114	144	United Arab Emirates		1	1	1	1	1	1	1									5
5111	145	Korea, DPR																	0
5113	146	China			1	1	1	1	1	1					1	1	1	1	7
5113	147	Mongolia					1	1	1	1					1	1	1	1	6
5114	148	Hong Kong, China					1	1	1	1									3
5114	149	Japan			1	1	1	1	1	1									4
5114	150	Korea, Rep.	1			1	1	1	1	1									4
5114	151	Macau, China					1	1	1	1									3
5211	152	Cambodia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12

Domain code	Serial No.	Country	T	M W M	F	Any T, M or F	T	D M	F	Any T, M or F	T	M D M	F	Any T, M or F	Sector T	M	F	Any T, M or F	Total data points
5212	153	Indonesia	1	1	1	1	1	1	1	1					1	1	1	1	9
5212	154	Lao PDR																	0
5212	155	Myanmar																	0
5212	156	Philippines	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
5212	157	Timor-Leste																	0
5212	158	Viet Nam	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
5213	159	Malaysia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
5213	160	Thailand	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
5214	161	Brunei Darussalam	1	1	1	1	1	1	1	1	1	1	1	1					9
5214	162	Singapore	1			1													1
5224	163	Australia	1	1	1	1	1	1	1	1									6
5224	164	New Zealand			1	1	1	1	1	1									4
5232	165	Papua New Guinea			1	1	1	1	1	1									4
5232	166	Solomon Islands	1	1	1	1	1	1	1	1									6
5233	167	Fiji	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
5311	168	Afghanistan																	0
5311	169	Nepal			1	1	1	1	1	1									4
5312	170	Bangladesh			1	1	1	1	1	1									4
5312	171	Bhutan																	0
5312	172	India	1			1	1	1	1	1									4
5312	173	Pakistan	1			1	1	1	1	1									4
5312	174	Sri Lanka	1			1	1	1	1	1									4
5313	175	Iran, Islamic Rep.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12
5313	176	Maldives																	0
Number of countries with some data																			
Total	**134**		**97**	**85**	**96**	**112**	**126**	**127**	**126**	**127**	**73**	**73**	**73**	**73**	**60**	**60**	**60**	**60**	**1 056**

Notes:
Number of countries (including countries with no data) 176.
Shaded cells: 7 cells in which data were deleted during subsequent editing because of inconsistency/implausibility.

The last column gives for each country the total number of data points available. The maximum number is 12 = 3x4, three items (T, M, F) for each of the four variables MW, D, MD and MW (sector). The value in this column exceeds 0 for 134 of the countries, these being the countries for which at least one data point was available. The sum of the column gives the total number of data points (1,056) in the whole database.[39]

39 As noted in section 4.3, seven of these data points were deleted during subsequent editing, resulting in the exclusion of one country.

Annex E

Data quality: Alternative imputation methods

In this annex the preliminary global and regional estimates of migrant workers are evaluated using alternative imputation procedures for the statistical treatment of countries with missing data.

To evaluate the extent to which the global and regional estimates of migrant workers depend on the particular method of imputation adopted for treating countries with missing values, two alternative imputation methods have also been applied to the datasets, one based on regressions and the other based on cross-product ratios. The two methods are described in detail below, and the results are then compared.

E.1 Imputation using regressions

The imputation method is based on an assumed relationship between the labour force participation rate of migrant workers and the national labour force participation rate. After fitting the data, the parameters of the relationship are estimated and used to derive estimates of the labour force participation of migrants from the information on the national labour force participation of the country.

Let MLFPR represent the labour force participation rate of migrants and NLFPR the labour force participation rate of non-migrants in a given country. In terms of the notations introduced earlier:

$$MLFPR = \frac{MW}{M}$$

and

$$NLFPR = \frac{W - MW}{P - M}$$

where MW is the number of migrant workers, M the number of working-age migrants, W the total labour force and P the total size of the working-age population of the country. Similarly, let LFPR represent the total labour force participation rate of the country, i.e.:

$$LFPR \quad \frac{W}{P}$$

Given this notation, the starting point of the methodology is to assume a simple linear relationship between the labour force participation rate for migrants and the corresponding rate for non-migrants as follows:

$$MLFPR = NLFPR + a + bp$$

where a and b are the unknown parameters of the assumed linear relationship and p is the share of working-age migrants in the total working-age population of the country, i.e.:

$$p = \frac{M}{P}$$

The relationship assumes that the difference between the labour force participation rates of the two populations varies linearly with the share of working-age migrants in the country. The linear relationship may be re-expressed in terms of the total labour force participation rate as follows:

$$\begin{aligned} NLFPR &= \frac{-MW}{P-M} \\ &= \frac{P}{P-M} \, x \, \frac{W-MW}{P} \\ &= \frac{1}{1-M/P} \, x \, (\frac{W}{P} - \frac{M}{P}\frac{MW}{M}) \\ &= \frac{1}{1-p} \, x \, (LFPR - pMLFP^{R}) \\ &= \frac{LFP^{R}}{q} - \frac{p}{q} MLFPR \end{aligned}$$

where q =1-p. Substituting the expression in the linear relationship between MLFPR and NLFPR one obtains, after rearranging terms and simplification:

TABLE **E.1**

Estimated regression parameters and regression fit of relationship between labour force participation rate of migrants and the national labour force participation rate, by sex and broad region

BOTH SEXES Broad region*	Number of countries	a	b	R^2
Arab States	8	-0.0833	1.0865	0.7588
Eastern Europe and Central Asia	8	0.0798	0.3048	0.3026
Latin America and the Caribbean	18	-0.1470	2.4569	0.3823
Northern Africa	3	-0.0902	12.0164	0.2784
Northern America	2	0.2373	-0.6612	1.0000
Northern, Southern and Western Europe	20	0.0952	0.4858	0.8709
South-Eastern Asia and the Pacific, + Southern Asia	9 + 9	-0.0029	0.6931	0.2702
Sub-Saharan Africa	11	-0.1229	-1.7847	0.5239

MALE Broad region*	Number of countries	a	b	R^2
Arab States	8	0.1295	0.1594	0.2740
Eastern Europe and Central Asia	8	-0.1387	0.3232	0.4640
Latin America and the Caribbean	18	-0.2552	3.7544	0.7376
Northern Africa	3	-0.2339	15.7899	0.6087
Northern America	2	2.1684	-11.726	1.0000
Northern, Southern and Western Europe	20	-0.0619	0.7298	0.0825
South-Eastern Asia and the Pacific, + Southern Asia	9 + 9	-0.1376	1.1676	0.4625
Sub-Saharan Africa	11	-0.1294	0.2268	0.3241

FEMALE Broad region*	Number of countries	a	b	R^2
Arab States	8	0.1085	0.9231	0.6837
Eastern Europe and Central Asia	8	0.0943	1.0147	0.2540
Latin America and the Caribbean	18	-0.0655	2.2220	0.0823
Northern Africa	3	0.0021	11.6334	0.7886
Northern America	2	-0.7667	4.8686	1.0000
Northern, Southern and Western Europe	20	0.0731	0.7690	0.5505
South-Eastern Asia and the Pacific, + Southern Asia	9+9 = 18	0.0076	0.8125	0.1593
Sub-Saharan Africa	11	-0.1018	-3.0117	0.5779

Note: * For this analysis two pairs of regions were merged: regions 32 and 33, together forming Eastern Europe and Central Asia; and South-Eastern Asia and the Pacific, merged with Southern Asia for the purpose of estimation. Eastern Asia was not included.

$$MLFPR = \frac{1}{q} LFPR - \frac{p}{q} + a + pb$$

$$qMLFPR = LFPR - pMLFPR + aq + pqb$$

$$pMLFPR + qMLFPR = LFPR + aq + pqb$$

$$LFPR = LFPR + aq + qb$$

It can be observed that the resulting expression is the relationship between the labour force participation rate of migrant workers and the corresponding rate for the total working-age population of the country. This relationship is parabolic in terms of p. This means that the difference between the labour force participation of migrants and the national labour force participation rate increases or decreases with the share of working-age migrants in the total working-age population at low values of p. The value of the difference between the two rates reverses its direction after reaching a threshold.[40]

The parabolic regression was fitted to the available data on migrant workers for each broad regional grouping and for men and women, as well as for both sexes, separately. The results are shown table E.1. The corresponding tables for men and women separately are also shown.

It can be observed that except for Northern America, Northern, Southern and Western Europe, and the Arab States (regions generally without much missing data), the regression fits are not close in other regions. The values R^2 are mostly around 0.30.[41]

Based on the estimated regression parameters, the number of migrant workers in countries with no available data is imputed as follows:

$$MW_j = M_j \, X \, MLFPR_J = M_j \, X\left(LFPR_j + \hat{a} q_j + p_j q_j \hat{b}\right) \qquad j \notin s$$

where a and b are the estimated regression parameters of the region in which the country belongs, M_j is the migrant working-age population in the country, $LFPR_j$ is the total labour participation of the country (W_j/P_j), p_j is the share of working-age migrants in the total working-age population (M_j/P_j) and q_j=1-p_j. All the necessary data are available from the benchmark UN and ILO datasets for 2013 on population, labour force and international stock of migrants.

As in the other imputations described earlier, the regression imputations were carried out for total population and also for male and female separately. The resulting estimates were then proportionally adjusted to ensure that the male and female estimates add up to the estimate for both sexes.

TABLE **E.2**

Cross-classification of the working-age population by migrant status and labour force status

		Migrant status		Total
		1	0	
Labour force status	1	a	b	W
	0	c	d	P-W
Total		**M**	**P-M**	**P**

E.2 Imputation using cross-product ratios

The other method used for the statistical treatment of countries with missing data on migrant workers was based on the calculation of cross-product ratios describing the relationship between migrant status and labour force status of the working-age population. Consider the cross-tabulation of the working-age population (P) by migrant status and labour force status as shown in table E.2.

In the cross-tabulation, migrant status equal to 1 means "migrant" and migrant status equal to 0 means "non-migrant". Similarly, labour force status equal to 1 means being in the labour force, and labour force status equal to 0 means being outside the labour force. There are M migrants indicated in the last row of the column Migrant status = 1, and there are W workers indicated in the last column of the row Labour force status = 1. The total number of non-migrants is therefore P-M and the total number of persons outside the labour force is P-W.

The core elements of the cross-tabulation are the number of migrant workers (a), the number non-migrants

40 The threshold may be calculated as the point where the parabolic relationship (aq+pqb) reaches its maximum, in other words, when the derivative of the function is zero, p=(b-a)/2.

41 The standard deviations of the estimated parameters by region, as well as the datasets used and calculations, are stored in an Excel file available from the ILO.

in the labour force (b), the number of migrants outside the labour force (c), and finally the number of non-migrants outside the labour force (d). These terms may be expressed as

a = MW
b = W-MW
c = M-MW
d = P-W-M+MW = (P-M) – (W-MW)

The degree of association between two dichotomous variables such as migrant status and labour force status specified here may be measured by the cross-product ratio defined by

$$\alpha = \frac{a \times d}{c \times b} = \frac{MW \times (P - W - M + MW)}{(M - MW) \times (W - MW)}$$

If the two variables are not associated together the cross-product ratio is 1 (α=1). Thus, if there is no association between migrant status and labour force status in a particular region, α = 1 for that region. In that case, the labour force participation rates of migrants and non-migrants are the same and the number of migrant workers may be derived by simply multiplying the number of migrants of working age (M) by the national labour force participation. In general, the cross-product ratio may take any value between -∞ and +∞. Table E.3 shows their values calculated on the basis of countries with available data by sex and for the 20 detailed subregions of the ILO regional groupings.

The estimates show a strong association between migrant status and labour force status (α>2) in the Arab States, all parts of Europe (Northern Europe, Southern Europe and Western Europe) and the Pacific Islands. By contrast, there is little association between the variables (α=1) in the Caribbean, Central America and North Africa.

Consider now a country j for which no data on migrant workers were found. An estimate of the migrant workers in that country may be obtained under the assumption that the association between migrant status and labour force status in the country is the same as that of the region to which it belongs. Under this assumption, the estimation of migrant workers in country j consists of finding the value a = MW which together with data on population of working age (Pj), migrants of working age (Mj), and total labour force (Wj) gives the cross-product ratio of the region to which the country belongs.

It can be shown that the desired value a is the solution of the quadratic equation,

$$Ax^2 + Bx + C = 0$$

where A=1-α, B=Pj-(1-α)(Mj+Wj) and C=-αMjWj. The solution is given by

$$MW_j = \frac{B + \sqrt{B^2 - 4BC}}{2A}$$

$$= \frac{-[P_j - (1-\alpha)(M_j + W_j)] + \sqrt{[P_j - (1-\alpha)(M_j + W_j)]^2 + 4\alpha(1-\alpha)M_jW_j}}{2(1-\alpha)}$$

The procedure was applied to the datasets on migrant workers, and the estimates of the number of migrant workers for countries with no available data were calculated for male, female and both sexes, separately. As in standard practice, the estimates were proportionally adjusted to ensure that the sum of the male and female estimates is equal to the estimate of total.[42]

42 The full datasets used and calculations are stored in an Excel file at the ILO. The results have been compared with the corresponding estimates obtained from the other imputation methods as part of the analysis of the global and regional estimates.

TABLE **E.3**

Estimated cross-product ratio of relationship between migrant status and labour force status, by sex and detailed subregion

Detailed subregion	Number of countries	Cross-product ratio (α)		
		Both sexes	Male	Female
Arab States	10	4.8953	3.4759	4.4090
Australia and New Zealand	1	1.7928	2.4312	1.6500
Caribbean	4	0.9764	1.0366	1.8955
Central Africa	1	0.5176	0.5978	0.3766
Central America	6	0.9018	0.5649	1.1591
Central Asia	4	1.5512	0.7507	8.7113
Eastern Africa	5	0.1877	0.2157	0.2279
Eastern Asia	1	1.9318	2.1589	1.7046
Eastern Europe	7	2.7601	0.5940	2.3161
Northern Africa	3	0.9929	0.5348	1.6938
Northern America	2	1.7509	1.7027	1.5173
Northern Europe	9	3.3320	0.7592	3.7775
Pacific Islands	2	2.4411	0.2178	2.8133
South America	9	0.7376	0.6751	0.7887
South-Eastern Asia	8	1.1717	0.9224	1.4653
Southern Africa	2	1.3618	1.5931	1.4544
Southern Asia	4	1.8767	1.9214	0.7728
Southern Europe	5	2.8195	0.8628	3.0440
Western Africa	7	1.4827	0.6642	0.8060
Western Europe	7	2.1180	2.0282	0.7184

E.3 Comparison of the results

Table E.4 compares the global estimates of migrant workers by sex obtained from the alternative imputation methods with those derived from the simple imputation method using subregional averages. The results show close agreement among the global estimates. The alternative imputation methods give slightly higher global estimates (150.9 million using regression, 151.8 million using cross-product ratios, against 150.6 million using subregional averages). The discrepancies by sex are slightly higher but do not exceed 2 per cent.

The comparison by region presented in table E.5 also shows close agreement between the regional estimates obtained from the different methods of imputation. The highest relative discrepancy is about 2.2 per cent and relates to the estimates for Arab States, using regression imputations.

Finally, the comparison of the estimates by income level of countries is shown in table E.6. The results show close agreement in absolute numbers, but considerable differences in relative numbers. The highest discrepancies in absolute terms concern the regression imputation methods for lower- and upper-middle income countries. The results deviate by more than 1.3 million migrant workers with the corresponding estimates obtained from imputation with subregional averages.

In relative terms, the highest discrepancy is for the estimate of migrant workers for low income countries based on the method of imputation by cross-product ratios. The difference is about 16 per cent, but it may

TABLE **E.4**

Alternative imputation of countries with missing data, by sex			
('000)	**Imputation method**		
	Subregional average*	**Quadratic regression**	**Cross-product ratio**
Total	**150 631**	**150 866**	**151 821**
Male	85 064	85 716	86 602
Female	65 567	65 150	65 219

Note: *Estimates in this table differ somewhat from the "final" estimates presented in the body of this report. The above were computed using an earlier version of the data file and of details of the estimation procedure used. Nevertheless, these differences have little effect for the present purpose, which is to assess the effect of different imputation procedures on the results.

TABLE **E.5**

Alternative imputation of countries with missing data, by major region			
('000)	**Imputation method**		
	Subregional average	**Quadratic regression**	**Cross-product ratio**
Total	**150 631**	**150 866**	**151 821**
Africa	8 400	8 258	8 499
Americas	41 286	41 333	41 132
Arab States	18 046	18 460	18 203
Asia and the Pacific	25 017	24 839	24 865
Europe and Central Asia	57 882	57 976	59 122

Note: The standard 11 broad subregions used for presentation of the results in the body of this report have been collapsed for the purpose of this table. See also note to table E.4.

TABLE **E.6**

Alternative imputation of countries with missing data, by income group			
('000)	**Imputation method**		
	Subregional average*	**Quadratic regression**	**Cross-product ratio**
Total	**150 631**	**150 866**	**151 821**
Low income countries	3 426	3 612	3 974
Lower-middle income countries	17 373	16 069	17 248
Upper-middle income countries	15 637	16 975	16 759
High income countries	114 195	114 210	113 840

Note: *See notes to the preceding tables.

be explained by the relatively small size of the aggregate itself (about 3 million), that transforms a small difference in absolute terms into a large difference in relative terms.

E.4 Concluding remarks

In conclusion, a qualification should be noted. The above analysis shows on the whole close agreement in the results coming from quite different methods of imputation. However, the analysis has dealt with variable MW, the number of migrant workers. Data are not missing on this variable to the same extent as data on variables concerning migrant domestic labour (MD). Whether the conclusions here apply also to variables with greater proportions of missing data needs to be verified.

All results presented in this report have used the method based on cell averages of the cross-tabulation of detailed subregions and income groups to impute missing country values in the cell, separately for total, male and female populations, as described in section 6.

Annex F

Data quality: Comparison with ILO 2010 global and regional estimates of the number of domestic workers

The focus of this report is on global and regional estimates of *migrant* workers and *migrant* domestic workers. An estimation of the number of all domestic workers is in this sense not the primary objective. Nevertheless, the number of all domestic workers is a parameter in the estimation of the number of migrant domestic workers and is therefore produced as a byproduct of application of the present procedure.

In 2013, the ILO published global and regional estimates of domestic workers for 2010. The estimates referred to 177 countries and territories, all included in the present study except Netherlands Antilles. The underlying data were obtained from national census and survey sources and in a few cases from administrative records. A great part of the country data, but not all, has also been used in the present study. The estimation methodology was however rather different. It involved weight adjustments for countries with missing data as opposed to explicit imputations. Also, there were different approaches to standardization of the national datasets. The detailed methodology is described in Appendix I of the publication (ILO, 2013c, pp. 108–115).

The definition of domestic worker was similar to that adopted in the present study, namely, branch of economic activity codes 95 or 97 of the International Standard Industrial Classification of All Economic Activities (ISIC Rev 3, Rev 3.1 or ISIC Rev 4) or its national equivalent. There is however an important difference. The 2010 global estimate covered currently employed domestic workers as opposed to the present study, which in principle includes both currently employed and unemployed domestic workers.

Table F.1 compares the global and regional estimates of domestic workers for 2013 obtained from the present study with the corresponding ILO estimates for 2010. The countries and territories have been regrouped to match the regional grouping of the 2010 estimates. The grouping in the 2010 estimates was into six major regions; the countries comprising each region are listed in the notes to the table.

The results show a considerably higher estimate of the number of domestic workers in 2013 relative to the 2010 estimate. The global number of domestic workers in the present exercise is estimated at 67 million for 2013, compared to a little under 53 million in 2010, an increase of over 25 per cent.

The differences at the global level may be the result of a number of general factors:

(i) Population growth between 2010 and 2013 is a factor contributing to the difference.
(ii) Additional contribution to increase over time may also come from socio-economic factors such as economic development, increased inequality, and urbanization.
(iii) In addition, a part of the difference is due to the additional component of unemployed domestic workers included in principle in the 2013 estimate but not in the 2010 estimate.
(iv) We believe that the present methodology is more precise and subject to less bias of underestimation.
(v) Perhaps the most important contributing factor is the availability of more and possibly better data for the 2013 study, not available for the 2010 study.

In any case, there are measurement errors in any estimation process and a degree of discrepancy should be expected in results using somewhat different databases and methodologies.

It is instructive to compare the distribution of domestic workers across regions in the 2010 and 2013 estimates. These are shown in column (2) of the respective panels in the table. Their difference in percentage points is shown in column (6). The most significant differences in the two distributions are the following.

(i) For Industrialized Countries and for Africa, the share in each case is larger by around 4 percentage points in the 2013 estimates compared to the 2010 estimates.
(ii) For Latin America and the Caribbean, the share is reduced by over 10 percentage points.

TABLE **F.1**

Comparison of global and regional estimates of domestic workers, 2010[1] and 2013

	Total (male+female)	ILO 2010 estimates[1]			New 2013 estimates			
		(1)	(2)	(3)	(1)	(2)	(4)	(6)
1	Industrialized countries[2]	3 555	6.8	0.8	7 212	10.7	1.4	4.0
2	Eastern Europe and CIS[3]	595	1.1	0.3	1 221	1.8	0.5	0.7
3	Asia and the Pacific excluding China[4]	12 077	23.0	1.2	14 466	21.5	1.4	-1.4
3.1	China	9 390	17.9	1.2	13 217	19.7	1.6	1.8
4	Latin America and Caribbean[5]	19 593	37.3	7.6	17 903	26.7	6.0	-10.6
5	Africa[6]	5 236	10.0	1.4	9 297	13.8	2.2	3.9
6	Arab States[7]	2 107	4.0	5.6	3 823	5.7	7.7	1.7
	Total	**52 553**	**100.0**	**1.7**	**67 139**	**100.0**	**2.0**	**0.0**

	Female	ILO 2010 estimates[1]				New 2013 estimates				
		(1)	(2)	(3)	(5)	(1)	(2)	(4)	(5)	(6)
1	Industrialized countries[2]	2 597	6.0	1.3	0.73	5 736	10.7	2.5	0.80	4.7
2	Eastern Europe and CIS[3]	396	0.9	0.4	0.67	863	1.6	0.8	0.71	0.7
3	Asia and the Pacific excluding China[4]	9 013	20.7	2.5	0.75	10 713	19.9	3.2	0.74	-0.7
3.1	China	8 451	19.4	2.6	0.90	11 728	21.8	3.1	0.89	2.4
4	Latin America and Caribbean[5]	18 005	41.3	17.4	0.92	15 677	29.2	12.5	0.88	-12.1
5	Africa[6]	3 835	8.8	2.5	0.73	6 843	12.7	3.7	0.74	3.9
6	Arab States[7]	1 329	3.0	20.5	0.63	2 195	4.1	24.9	0.57	1.0
	Total	**43 626**	**100.0**	**3.5**	**0.83**	**53 753**	**100.0**	**4.0**	**0.80**	**0.0**

Column headings:
(1) Domestic workers ('000)
(2) % share of total
(3) Share in total employment
(4) Share in total labour force
(5) Proportion of females among domestic workers: ratio (1)female/(1)total
(6) Change in the % distribution: % in 2013 - % in 2010

Notes:

[1] ILO, 2013c, p. 20, table 3.1.

[2] Australia, Austria, Belgium, Canada, Cyprus, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Japan, Republic of Korea, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States.

[3] Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Poland, Romania, Russian Federation, Serbia, Slovakia, Slovenia, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, Uzbekistan.

[4] Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, Fiji, Hong Kong (China), India, Indonesia, Islamic Republic of Iran, Democratic Republic of Korea, Lao People's Democratic Republic, Macau (China), Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Solomon Islands, Sri Lanka, Thailand, Timor-Leste, Viet Nam.

[5] Argentina, Bahamas, Barbados, Belize, Plurinational State of Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Suriname, Trinidad and Tobago, Uruguay, Bolivarian Republic of Venezuela.

[6] Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Democratic Republic of Congo, Côte d'Ivoire, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Reunion, Rwanda, Senegal, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, United Republic of Tanzania, Togo, Tunisia, Uganda, Zambia, Zimbabwe.

[7] Bahrain, Iraq, Jordan, Kuwait, Lebanon, Occupied Palestinian Territory, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates, Yemen.

It should be noted that in the case of industrialized countries, the 2010 report specifies the category as "Industrialized Countries (selected)", presumably implying that the coverage of countries in that region was less than complete. If so, this would have resulted in underestimation.

It has been suggested that the 2010 estimate for Latin America and the Caribbean is rather high, and out of line with estimates from other regions. For instance, in that region domestic workers are reported to form 7.6 per cent of total employment, a figure very much higher than those in other regions, which fall in the range 0.3-1.4 per cent with the (expected) exception of Arab States (5.6 per cent).

Columns (3) and (4) of the table show domestic workers as a proportion of total employment and of the total workforce in the respective panels for the 2010 and 2013 estimates. The two measures are not exactly the same. Since the 2010 estimates are in terms of employment, column (3) shows the share of domestic work in total employment. Since the 2013 estimates are in terms of labour force (including employment and unemployment), column (4) shows the share in total labour force.

In any case, the figures for the two estimates close, at least in terms of variation across regions. The overall average ratio for 2013 (2.0 per cent) is higher than the average for 2010 (1.7 per cent).

The second part of the table shows the same results for female domestic workers separately. The overall pattern is very close to that already discussed for the total (male+female) domestic workers. This is expected since 80 per cent or more of domestic workers are female.

The new information in the table for females concerns the variation across regions of the share of women among domestic workers. This is compared in column (5) of the respective panels for 2010 and 2013. The results for the two estimates are quite similar in structure. The main differences observed are higher in Industrialized Countries in 2013 than in 2010 (80 versus 73 per cent), and a lower percentage female among domestic workers in Arab States (57 versus 63 per cent). We may also note that the proportion of females is lower by a smaller margin (around 4 percentage points) in the 2013 estimates.

Overall, the percentage of females among domestic workers is 80 per cent according to the 2013 estimates, compared to 83 per cent in the earlier estimates.

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This report provides information on the order of magnitude of labour migration and migrant domestic workers. It begins with a presentation of the main results obtained and description of what is being estimated. It then provides a detailed description and analysis of the global and regional estimates of migrant workers and migrant domestic workers for 2013 with breakdown by sex and broad branch of economic activity. The report also describes the nature and quality of the data used, and the sources and methodology used as well as their limitations. Six annexes complement the material presented in the main body of the report.

The report intends to help draw attention to the economic and social issues of labour migration and facilitate the development of sound international statistical standards in the future.

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