International Labour Organization

ILO Monitor: COVID-19 and the world of work. Fourth edition

Updated estimates and analysis

27 May 2020

Key messages

Workplace and business closures

- As indicated by revised figures providing additional details on the scope of countries' workplace closure policies, **94 per cent of the world's workers are living in countries with some sort of workplace closure measures in place**. Although more and more countries are easing these measures to gradually allow workers to return to their workplaces, as at 17 May 2020,[1] 20 per cent of the world's workers lived in countries with required workplace closures for all but essential workers. An additional 69 per cent lived in countries with required workplace closures for some sectors or categories of workers, and a further 5 per cent lived in countries with recommended workplace closures.

Lost working hours in the first half of 2020 continue to reflect a severe impact on employment

- **The prospects for the second quarter of 2020 remain dire, with the latest ILO estimates revealing a decline in working hours of around 10.7 per cent relative to the last quarter of 2019, which is equivalent to 305 million full-time jobs** (assuming a 48-hour working week and using the updated baseline).[2] From a regional perspective, the Americas (13.1 per cent) and Europe and Central Asia (12.9 per cent) present the largest losses in hours worked.

The labour market benefits of testing and tracing

- **Testing and tracing of infections, as recommended by WHO, is strongly associated with lower labour market disruption. ILO estimates suggest that testing and tracing can help to reduce working hour losses by as much as 50 per cent**. The estimated average loss of hours for countries with the lowest intensity of testing and tracing is around 14 per cent, compared with 7 per cent for those with the highest intensity**.** This is an important factor to consider in the design of policy measures aimed at facilitating a safe return to work.

- Widespread testing and tracing enables countries to better utilize information and rely less on severely restrictive measures (**public health policy channel**) and, at the same time, helps to generate and maintain the public confidence necessary for economic activity (**economic confidence channel**). Testing and tracing can also help to minimize disruptions in operations at workplaces (**workplace operations channel**).

1 All figures quoted in this edition of the *ILO Monitor* have been calculated on the basis of data available as at 17 May 2020, unless otherwise stated.

2 Compared with the third edition of the *ILO Monitor*, the estimated working-hour loss for Q2 has increased by 0.2 percentage points, as the reference values of weekly hours worked, for computation, have been updated since the previous edition; however, the estimated full-time equivalent remains the same at 305 million jobs (see Technical Annex 1 for more details).

Young people are facing multiple shocks from the COVID-19 crisis, which could lead to the emergence of a "lockdown generation"

- Young people constitute major victims of social and economic consequences of the pandemic, and there is a risk that they will be scarred throughout their working lives – leading to the emergence of a "lockdown generation".
- The most recent figures show that **young people are disproportionately affected by the COVID-19 crisis**, with multiple shocks including disruption to education and training, employment and income losses, and greater difficulties in finding a job.
- **A total of 178 million young workers around the world**, more than four in ten young people employed globally, **were working in hard-hit sectors when the crisis began. Almost 77 per cent (or 328 million) of the world's young workers were in informal jobs**, compared with around 60 per cent of adult workers (aged 25 and above). The youth informality rate ranges from 32.9 per cent in Europe and Central Asia to 93.4 per cent in Africa. Even before the crisis, more than **267 million young people were not in employment, education or training (NEET), including almost 68 million unemployed young people**.
- **Both technical and vocational education and training (TVET) and on-the-job training are suffering massive disruption.** In a recent ILO–UNESCO–World Bank joint survey, around 98 per cent of respondents reported a complete or partial closure of technical and vocational schools and training centres. Although over two-thirds of training is now being provided at distance, often online, few low-income countries have actually made that transition.
- Another new global survey by the ILO and partners of the Global Initiative on Decent Jobs for Youth reveals that **over one in six young people surveyed have stopped working since the onset of the COVID-19 crisis**. Among young people who have remained in employment, working hours have fallen by 23 per cent. Moreover, around half of young students report a likely delay in the completion of their current studies, while 10 per cent expect to be unable to complete them at all. On a standardized scale of mental well-being, more than half of the young people surveyed have become vulnerable to anxiety or depression since the start of the pandemic.[3]

Policy responses

- **The ILO calls for urgent and large-scale policy responses to prevent long-lasting damage to young people** in terms of education/training and labour market prospects. Governments need to provide **comprehensive solutions to the above challenges**, combining elements from all four pillars of the ILO policy framework for responding to the COVID-19 crisis.
- Policy interventions targeting young people should be introduced within **comprehensive, inclusive and forward-looking employment policy frameworks**, including the effective implementation of employment/skills guarantees, linked to broader stimulus and recovery packages.
- Bringing about and sustaining an employment-rich recovery will be facilitated by **further testing and tracing of infections, along with careful monitoring of the impact of the crisis** on enterprises and workers in the sectors most affected, including those in the informal economy.
- Given the potential for change in the structure of the economy **in the post-COVID-19 period, support should be channeled to sectors that are able to create decent and productive employment.**

3 "Possible anxiety or depression" according to the Warwick-Edinburgh Mental Wellbeing Scales.

Context: The severe impacts of lockdown on workers continue

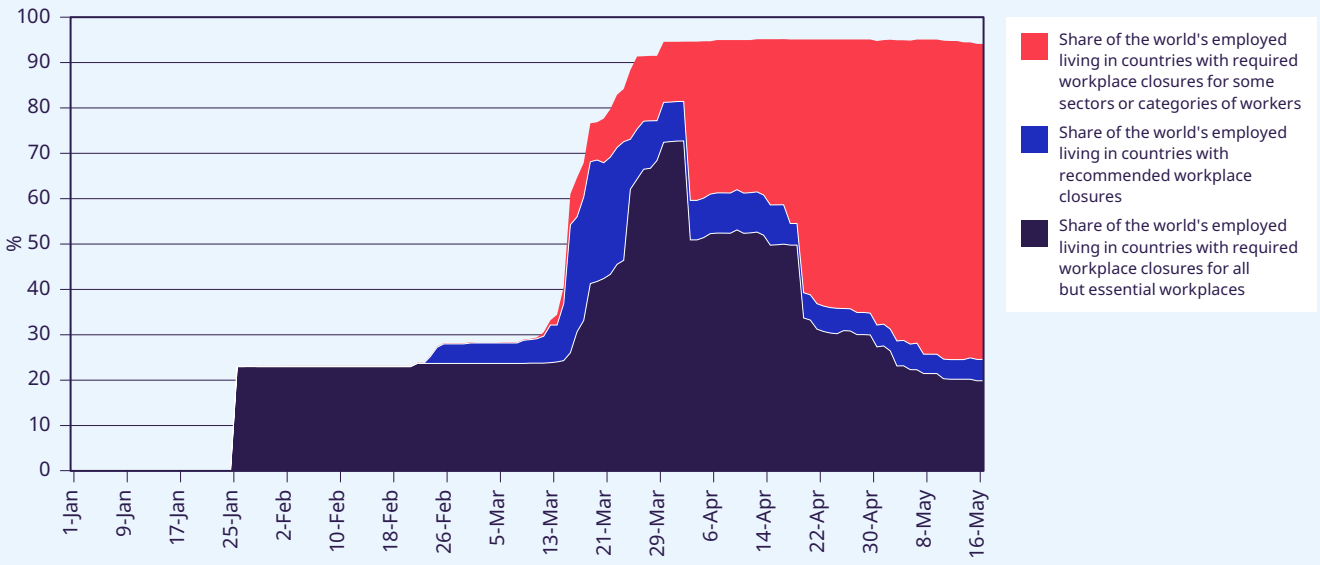
An overwhelming majority of workers around the world live in countries with some sort of workplace closure measures in place; around one-fifth of these live in countries that have closed all workplaces except those deemed essential. According to the latest version of the Oxford COVID-19 Government Response Tracker database,[4] as at 17 May 2020, 20 per cent of the world's workers lived in countries with required workplace closures for all but essential workplaces, an additional 69 per cent lived in countries with required workplace closures for some sectors or categories of workers, and 5 per cent lived in countries with recommended workplace closures (figure 1).

More countries have **relaxed workplace closure measures to enable workers to return gradually to their workplaces**. Since the beginning of April, several countries that had originally closed all but essential workplaces have been easing these measures. This translates into a decline, since early April, in the share of workers living in countries with required workplace closures for all but essential workplaces, along with a corresponding increase in the share of workers living in countries with required workplace closures for some sectors or categories of workers.

Unprecedented losses in working hours in the first half of 2020

The crisis continues to cause an unprecedented reduction in economic activity and working time, with the latest data confirming the previous estimates of working hours lost (see Technical Annex 1). An estimated 4.8 per cent of working hours were lost during the first quarter of 2020 (equivalent to approximately 135 million full-time jobs, assuming a 48-hour working week and using the updated

▶ **Figure 1. Relaxation of lockdown measures is leading to a declining share of workers in countries with general workplace closures**



Note: The shares of employed in countries with required workplace closures for some sectors or categories of workers and recommended workplace closures are stacked on top of the share of employed in countries with required workplace closures for all but essential workplaces.

Source: ILOSTAT, ILO modelled estimates, November 2019, and Oxford COVID-19 Government Response Tracker.

4 Since the last edition of the *ILO Monitor*, the Oxford COVID-19 Government Response Tracker has been enhanced, with new indicators added and revisions made to existing indicators in order to provide a more detailed picture of the situation related to physical distancing measures around the world. Moreover, coverage has been expanded to include data on workplace closures for 15 additional countries. This means that the resulting new scores are not strictly comparable with those quoted in previous editions of the *ILO Monitor*. Most notably, the workplace closures indicator was revised to better capture nuances in the types of measures adopted across countries. In the new version of the database, the categories of workplace closures include: (1) required closure of all but essential workplaces; (2) required closure of workplaces in selected sectors or of selected groups of workers; (3) recommended workplace closures; and (4) no workplace closure measures.

baseline), relative to the fourth quarter of 2019.[5] This represents a slight upward revision of around 7 million full-time jobs since the third edition of the *ILO Monitor*, indicating that in the first quarter of 2020 the crisis hit labour markets harder than previously estimated, especially in upper-middle- and high-income countries.[6]

The estimated decline in work activity in the first quarter of 2020 is uneven across regions. While the number of hours worked in the first quarter of 2020 declined by 6.5 per cent in Asia and the Pacific (driven by an 11.6 per cent decrease in East Asia), all other major regions experienced decreases of 3 per cent or less in the first quarter. This labour market pattern is closely related to the timing of outbreaks and the introduction of physical distancing measures in different regions of the world. Global patterns in hours lost in the first quarter are driven to a great extent by the exceptional impact of the COVID-19 crisis in China during that quarter.

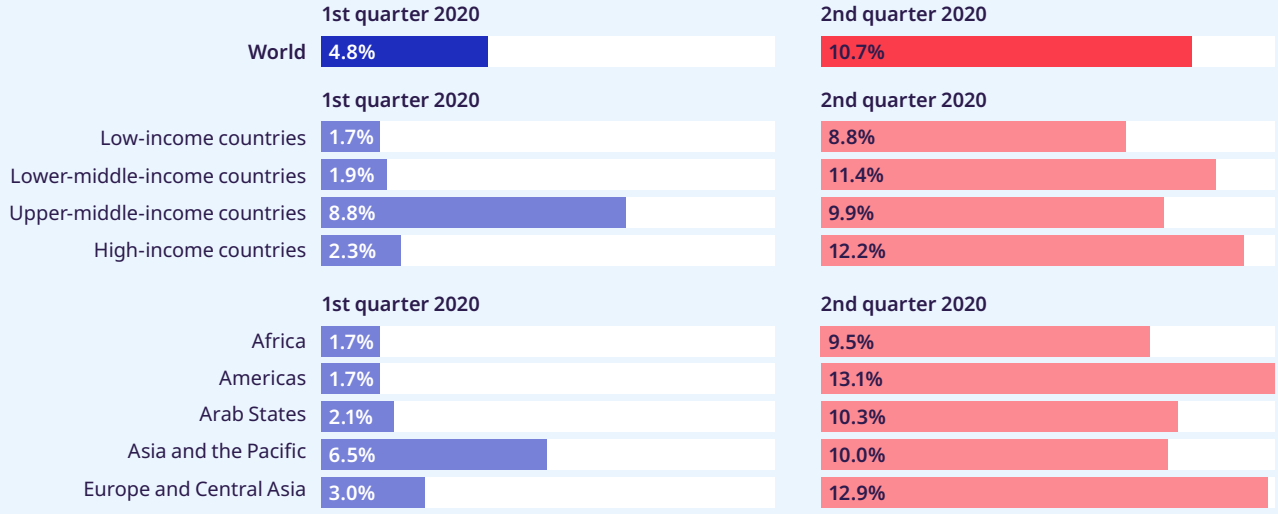
The prospects for the second quarter of 2020 remain dire. As at 17 May 2020, estimates indicate that working hours will decline in the current quarter (Q2) by around 10.7 per cent relative to the last quarter of 2019, which is equivalent to 305 million full-time jobs (assuming a 48-hour working week and using the updated baseline) (figure 2).

From a regional perspective, the Americas and Europe and Central Asia present the largest losses in hours worked. In the Americas, the loss of working hours in the second quarter is expected to reach 13.1 per cent relative to the pre-crisis level. In Europe and Central Asia, the decline is estimated at 12.9 per cent. The estimates for the other regions follow closely, all being above 9.5 per cent. South America and Southern and Western Europe are the regions with the largest upward revisions to loss of hours worked (by more than one percentage point) since the third edition of the *ILO Monitor* – reflecting, respectively, the deteriorating situation in South America and the fact that the labour market impact of the measures taken in Europe has been more severe than expected.

However, through intensive testing and tracing, some countries have managed better than others to control the spread of COVID-19 and to minimize the restrictions to economic activity. As many countries gradually ease their lockdown measures to enable workers to return to their workplaces, it is crucial to monitor how these changes will affect working hours, employment and labour income in the coming months.

Figure 2. Drop in working hours in the first and second quarters of 2020 is severe

Estimated percentage drop in aggregate working hours relative to the pre-crisis baseline (4th quarter 2019, seasonally adjusted)



Source: ILO nowcasting model.

5 The fourth quarter of 2019, seasonally adjusted, is used as the baseline period in the ILO nowcasting model in order to have a benchmark against which to assess the impact of the COVID-19 crisis on the labour market. All estimates of working hours lost refer to this fixed reference period.

6 The ILO has revised the baseline estimate of hours worked. However, the full-time equivalents of hours of work lost presented here are of similar magnitude to those presented in the previous edition of the *ILO Monitor*.

Testing and tracing

Much of the loss in working hours in the current crisis is due to the public health measures taken to tackle the pandemic, which vary in their effectiveness and in the level of disruption they cause to production and consumption. The World Health Organization (WHO) recently reiterated the importance of case finding, testing, contact tracing, and isolation and care[7] – henceforth referred to as "testing and tracing" or "T&T" – in combating the COVID-19 pandemic. Testing and tracing measures cause less labour market disruption than strict confinement and lockdown measures and have attracted considerable attention as many countries develop strategies to help workers to return safely to work.[8]

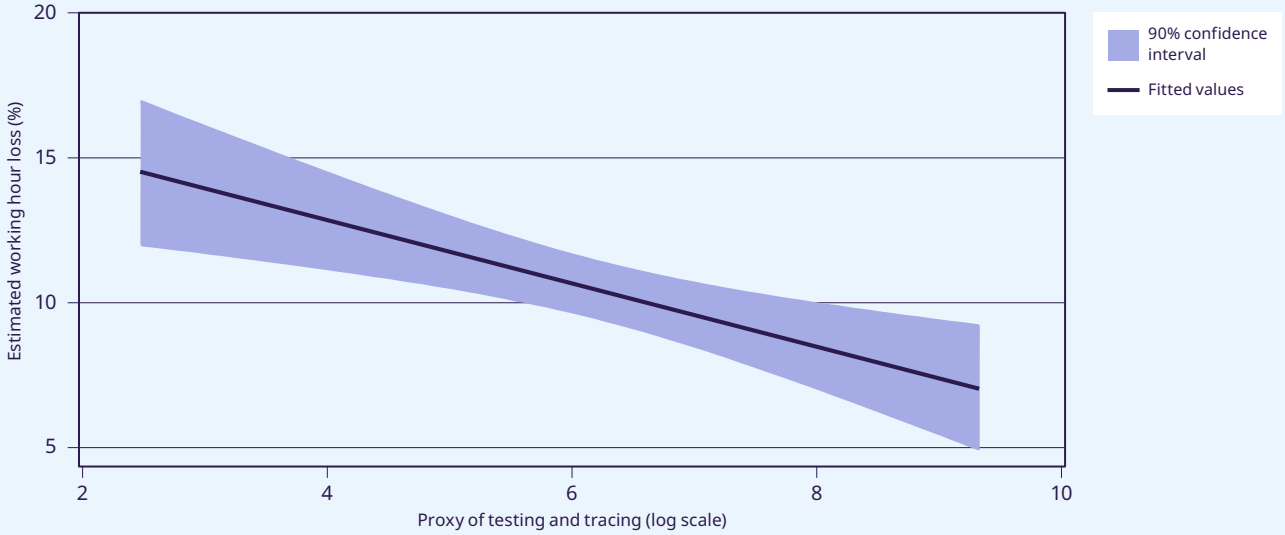
To assess the link between testing and tracing and labour market disruption, we have analysed the relationship between a proxy for T&T intensity and the estimated loss of working hours in the second quarter of 2020 (see Technical Annex 2 for more details). The aim was to establish whether the loss of working hours in countries diminishes significantly as T&T efforts increase. It should be noted that this analysis does not allow us to infer a causal relationship between such measures and labour market disruption. Given the significant policy implications, it is important to analyse this relationship by making best use of existing information.

ILO estimates suggest that testing and tracing is associated with a reduction in working hour losses by as much as 50 per cent (figure 3). The estimated average loss of working hours for countries with the lowest T&T intensity is around 14 per cent, compared with 7 per cent for those with the highest intensity. The results consistently point to a relationship between T&T and hours of work that is of great economic significance. A strong correlation still holds when other relevant factors are controlled for (e.g. labour market policies). This is also the case when different indicators of T&T intensity are used (see Technical Annex 2).

A number of channels, including public health and economic factors, can explain the beneficial effect of testing and tracing on labour market outcomes. These channels all rely on improved knowledge and awareness gained through T&T.

First, widespread T&T helps countries to rely less on severely restrictive measures (**public health policy channel**). Countries with an effective T&T programme (such as the Republic of Korea) tend to have lower probability, duration and severity of confinement and lockdown measures, which reduces the economic toll of these measures.

▶ **Figure 3. Expected loss in working hours (%) is strongly correlated with testing and tracing (45 countries)**



Note: The estimated slope coefficient is –0.011 with a *t*-statistic of –2.95, and the *p*-value is 0.005. The confidence interval implies uncertainty in the estimated effect. Nevertheless, the degree of association is statistically significant.

7 Dr Tedros Adhanom Ghebreyesus, WHO Director-General, opening remarks at a media briefing on COVID-19 held on 13 April 2020.

8 See e.g. ILO: *A safe and healthy return to work during the COVID-19 pandemic*, ILO policy brief, 21 May 2020.

Secondly, by influencing risk perceptions, T&T can help to generate and maintain the public confidence necessary for economic activity (**economic confidence channel**). Having more precise knowledge about the evolution of the pandemic and assurance about access to testing is likely to mitigate the impact of the pandemic on both consumption and production. If risks are reduced and public confidence is enhanced, this can clearly boost economic activity.

Thirdly, T&T can help to minimize disruptions in operations at workplaces (**workplace operations channel**). In particular, increased T&T could enable enterprises to organize and execute workplace activities more efficiently and safely. For instance, organizing precautionary measures, workers' shifts and sick leave replacements, as well as maintaining operational continuity, are all made easier by T&T.

These benefits need to be weighed against the costs associated with testing and tracing. Few data sources are available to quantify the cost of specific policy measures taken to contain COVID-19. However, there are indications that the financial resources required for effective T&T are far less than the overall economic impact of the pandemic (see Technical Annex 2). For instance, we estimate that testing expenditures in two countries with extensive T&T programmes are below 0.1 per cent of gross domestic product (GDP). Given the need to promote a safe return to work and the highly favourable benefit-to-cost ratio of T&T, investing in such a strategy provides a large expected return both in economic and social terms. Furthermore, T&T can help to create new employment opportunities, even if temporary, which can be targeted at young people and other affected groups. The social cost of the pandemic can thus be further reduced. Cost implications also mean that low-income countries will require financial and technical assistance for T&T implementation to maximize the likelihood of the international community as a whole succeeding in controlling the pandemic while promoting a safe return to work.

One key consideration of testing and tracing concerns data privacy. T&T programmes are only effective if they enjoy broad public support, which hinges on the inclusion of privacy safeguards. The implementation of T&T at the workplace should be in accordance with the principles governing the privacy of workers' personal data – notably that the data should be processed lawfully and fairly, and only for reasons directly relevant to occupational safety and health, and that the use of such data does not lead to discrimination in respect of employment or occupation. The ILO code of practice, *Protection of workers' personal data* provides important guidance that remains relevant even in this context.[9]

The COVID-19 crisis is hitting young people faster and harder: Urgent action is necessary to prevent the risk of a "lockdown generation"

Even at the best of times, young people (aged 15 to 24) are more likely to be unemployed or in worse quality jobs than adults (aged 25 and above). The global youth unemployment rate in 2019 (13.6 per cent) was well above the pre-global financial crisis rate in 2007 (12.3 per cent).[10] More than three-quarters of young workers in 2019 were in informal jobs (most notably in Africa and South Asia), which render them vulnerable to economic crises and shocks.

On top of the longer-term challenges, the COVID-19 crisis is affecting young people around the world in three ways: (1) disruption to education and training, which could reduce potential employment opportunities and earnings in the future; (2) the current wave of job losses and the collapse of businesses and start-ups are reducing earnings and employment (and threatening rights at work); and (3) the emergence of greater obstacles to finding work, (re-)entering the labour market and trying to transition to better jobs.

Exclusion of young people from the labour market, given the long-lasting impacts, is one of the greatest dangers for society in the current situation. In the long run, the combined educational and labour market crisis threatens not only to impair the quality and quantity of jobs but also to exacerbate existing inequalities across and within countries.

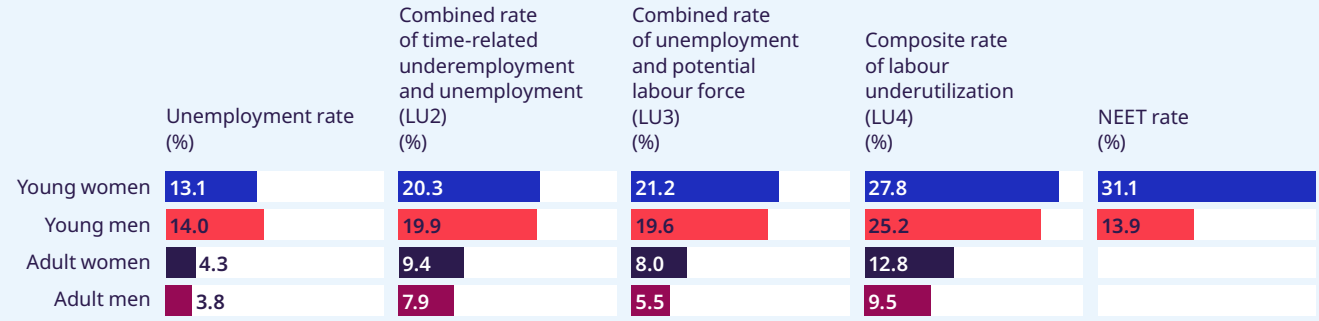
Young people were facing challenges in the labour market before the COVID-19 crisis

Before the onset of the COVID-19 crisis, unemployment affected 67.6 million young women and men. Around one-fifth of young people worldwide, or 267 million, are not in employment, education or training (NEET). The NEET rate of young women exceeds 31 per cent, compared with 13.9 per cent for young men, reaching almost 40 per cent in lower-middle-income countries. A significant number of young people, especially young women, are underutilized in the labour market, including those who are in time-related underemployment and those in the potential labour force, which includes discouraged workers who have given up looking for a job (figure 4).

9 ILO: *Protection of workers' personal data* (Geneva, 1997).

10 ILO: *Global Employment Trends for Youth 2020: Technology and the future of jobs* (Geneva, 2020), table 1.3, p. 33.

Figure 4. Labour underutilization was much higher among young people, especially young women, than among adults before the COVID-19 crisis (global estimates for 2019)



Source: ILO modelled estimates, November 2019.

When employed, young people are concentrated in types of work that render them vulnerable to income and job losses during the current crisis. Almost 77 per cent, or 328 million of the world's young workers are in informal jobs, compared with around 60 per cent of adult workers (aged 25 and above) (Statistical annexes, table A1).[11] Informal employment tends to be characterized by poorer working conditions, along with weaker trade union representation and protection through the employment relationship.

The informality rate for young people rises to over 95 per cent in low-income countries and to 91.4 per cent in lower-middle-income countries, more than 8 percentage points higher than for adults (aged 25 and above) (Statistical annexes, table A1). The informality rate is highest in Africa (93.4 per cent), Asia and the Pacific (84.4 per cent) and the Arab States (71.2 per cent). Another reflection of informality is the dominance of self-employment among youth: globally, 39.8 per cent of young people are self-employed, though this share ranges from 10.8 per cent in Europe and Central Asia to 70.1 per cent in Africa.[12] While the self-employed category includes many successful entrepreneurs, it also includes the masses of working poor and informally employed young people in both urban and rural areas, especially in low- and middle-income countries.

Young people earn less than prime-age[13] adults and are more vulnerable to income shocks. The analysis of data from 64 countries (accounting for 30 per cent of the world's young employees) indicates that hourly earnings are, on average, 71 per cent higher for prime-age adults than for young people. This reflects the fact that young people tend to work in low-paid occupations and sectors (many of which have been hit hard by the COVID-19 crisis) and have less seniority. Consequently, and also because of their lower levels of savings, young people are particularly vulnerable to income shocks.

Young people under the age of 30 account for around 70 per cent of international migrant flows.[14] Many young migrants have suffered the impact of workplace and border closures, and have not been able to return either to their jobs or to their country of origin.

11 ILO estimates based on data from 134 countries representing 91 per cent of global employment. Extrapolated to 2020 employment data by age.

12 ILO modelled estimates, November 2019, ilostat.ilo.org.

13 "Prime-age" denotes adults aged 25 to 54.

14 ILO: *Global Employment Trends for Youth 2017: Paths to a better working future* (Geneva, 2017), box 1.2, p. 8.

Young people are disproportionately affected in some of the high-risk sectors

Before the onset of the COVID-19 pandemic, 178 million young people around the world – more than four in 10 young workers – were working in the four sectors that are most adversely affected by the crisis (table 1).[15] Young people are more concentrated in hard-hit sectors than adults aged 25 and above, particularly in accommodation and food services and wholesale and retail trade. Disruptions to supply chains will have devastating consequences for employment in manufacturing, which will also affect young people, particularly young women, in such sectors as the garment industry in low- and middle-income countries.

Almost three-quarters of the young people working in these four hardest-hit sectors (131 million) are informally employed (Statistical annexes, table A2). This vulnerable group is largest in upper-middle-income countries, where 54 million informally employed young people were working in the hardest-hit sectors at the onset of the COVID-19 crisis.

▶ Table 1. Global estimates of youth employment in hard-hit sectors

		Baseline employment estimates for 2020 (before COVID-19 crisis)		
Economic sector	Impact of crisis on economic output	Level of employment (millions)	Share in global youth employment (%)	Share of young women in total youth employment (%)
Wholesale and retail trade; repair of motor vehicles and motorcycles	High	74.8	17.5	41.7
Manufacturing	High	59.2	13.8	36.9
Real estate; business and administrative activities	High	16.4	3.8	43.8
Accommodation and food services	High	28.1	6.6	50.8
Transport, storage and communication	Medium-high	21.0	4.9	16.4
Arts, entertainment and recreation, and other services	Medium-high	28.4	6.6	60.3
Mining and quarrying	Medium	2.9	0.7	22.6
Financial and insurance services	Medium	4.6	1.1	54.7
Construction	Medium	33.1	7.7	5.4
Agriculture, forestry and fishing	Low-medium	123.7	28.9	36.0
Utilities	Low	2.0	0.5	21.3
Public administration and defence; compulsory social security	Low	8.6	2.0	33.3
Human health and social work activities	Low	11.8	2.7	74.2
Education	Low	13.2	3.1	69.5

Note: Impact ratings are based on the ILO's assessment of real-time and financial data (see the second edition of the *ILO Monitor*, released on 7 April 2020), ILOSTAT baseline data on sectoral distribution of employment (ISIC Rev. 4) and ILO Harmonized Microdata.

Source: ILO modelled estimates, November 2019.

15 The second edition of the *ILO Monitor*, released on 7 April 2020, shows that, as a result of the COVID-19 crisis, certain sectors have suffered a severe decline in economic output, including accommodation and food services, wholesale and retail trade, manufacturing, and real estate and other business activities.

While young women account for less than 39 per cent of global youth employment, they make up almost 51 per cent of youth employment in accommodation and food services, 41.7 per cent in wholesale and retail trade, and 43.8 per cent in real estate and other services activities. Owing to widespread school closures and the lack of affordable childcare services, the double burden of paid and unpaid work is intensifying for young women, especially those with small children.

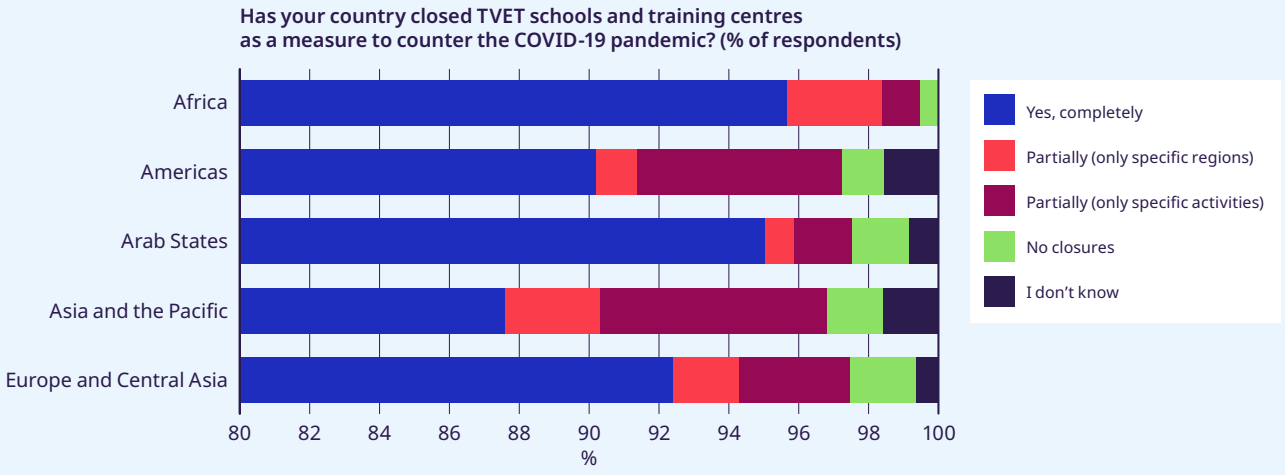
At the front line of the response to the pandemic are 11.8 million young people working in the health and social care sector. Approximately 74 per cent of young people employed in that sector are women.

Disruption to education, training and work-based learning

The COVID-19 crisis has caused major disruption through the closure of schools, universities and technical and vocational education and training institutions, and through the interruption of work-based learning, such as apprenticeships and traineeships. Before the pandemic, almost 496 million young people were engaged in upper secondary, post-secondary non-tertiary, and tertiary education.[16] Many of them are now suffering significant disruption to their studies. The preliminary results of a recent ILO–UNESCO–World Bank joint survey show that around 98 per cent of respondents across all regions reported a complete or partial closure of technical and vocational education schools and training centres (figure 5), with three in four reporting the cancellation or postponement of exams and other assessments. **Over two-thirds of training is now provided at distance and nearly every second training centre has switched to online provision of training**.[17] This is a remarkable development, since only one in five training centres offered online courses before the crisis. However, the number of complete school closures is highest in Africa, a region that is not well-equipped to switch to distance education and training, including online courses.

Because of weaker infrastructure and higher barriers to accessing technology (hardware and software) and online learning services, the negative impact of school and training closures on outcomes for learners is greater in low-income countries (and in poorer households in both low- and high-income countries).[18] The lack of digital skills among teachers and students is another hurdle in the implementation of effective online teaching and learning. As indicated by the survey, due to weak infrastructure, poor access to the Internet and a lack

Figure 5. The closure of TVET schools and training centres has affected all regions, particularly Africa



Source: ILO–UNESCO–World Bank joint survey on the provision of TVET during the COVID-19 crisis.

16 Based on UNESCO enrolment data, uis.unesco.org.

17 The ILO–UNESCO–World Bank joint survey on the provision of TVET during the COVID-19 crisis was conducted over a period of six weeks from 5 April to 15 May 2020. The survey elicited 1,348 responses from 126 countries.

18 See also S. Carvalho and S. Hares: "More from our database on school closures: New education policies may be increasing educational inequality", Center for Global Development, 30 Mar. 2020.

of IT equipment only a small proportion of low-income countries have switched to online courses. Most have, instead, relied on television and radio broadcasts and traditional written materials to support distance learning.

Disruption to education and training threatens to create a lifelong earnings penalty for young people who are forced to quit their studies. For example, the potential long-term losses in future earnings resulting from four months of school closures in the United States are estimated at US$2.5 trillion, or 12.7 per cent of GDP.[19]

Youth unemployment is rising faster and by a greater amount during the COVID-19 crisis

Recent data point to a massive increase in the youth unemployment rate since February 2020, particularly for young women. In Canada, from February to April 2020, the unemployment rate increased by just over 6 percentage points for adults but by 14.3 percentage points for young men (to 27.1 per cent) and by 20.4 percentage points for young women (to 28.4 per cent).[20] A similar scenario can be observed in the United States, where the unemployment rate for young men (aged 16–24) increased by a comparable amount from February to April 2020 (from 8.5 to 24.0 per cent), while the rise for young women (aged 16–24) was even greater (from 7.5 to 29.8 per cent). Similar trends in the youth unemployment rate have emerged in other countries (e.g. Australia, China, Ireland, Republic of Korea, the Netherlands and Switzerland).

Changes in the unemployment rate do not, however, reveal the full extent of the crisis. Labour force participation rates for young people have also fallen significantly around the world. Available data show that the youth labour force participation rate fell from February to April 2020 by 7.1 percentage points in Australia, 11.7 points in Canada, 1.9 points in the Republic of Korea and 7.5 points in the United States. The decline in the labour force participation rate of adults aged 25 and above is between 0.4 percentage point in the Republic of Korea and 4.2 points in Canada.[21] Because of the current constraints on searching for jobs, the challenge is to ensure that young people do not lose their attachment to the labour market, as that would make it more difficult for them to rejoin once economies recover.

There is evidence of young people suffering long-lasting and devastating effects of protracted unemployment – also known as "scarring effects" – particularly when entering the labour market during a recession. Empirical evidence shows that entering the labour market during a recession can negatively affect young people's labour market outcomes for a decade or longer. Owing to unfavourable economic conditions, young people fail in their early attempts to find work or end up in a job that does not match their educational background.[22] Given that the recession precipitated by the COVID-19 crisis is far more severe than previous recessions, long-lasting wage losses are likely to be experienced by entire cohorts of young people who have the misfortune of graduating from secondary school or university during the 2019/20 academic year. They will face greater competition for fewer jobs over the coming years.[23]

Official labour force survey or other household data from developing countries are not yet available for April 2020 to provide a more complete picture of the impact of the COVID-19 crisis on young people around the world. However, it is expected that unemployment will increase rapidly, while the quality of employment and income levels will be further undermined.

In order to better understand the impact of the crisis on young people and to address the data gaps, **the ILO and partners of the Global Initiative on Decent Jobs for Youth have conducted a "Global Survey on Youth and COVID-19"** (See Technical Annex 3).[24] The preliminary findings from this online survey (over 13,000 responses had been received by 21 May 2020) reveal that young people around the world, including in developing countries, have been severely impacted by the COVID-19 crisis.

19 G. Psacharopoulos et al.: "The COVID-19 cost of school closures", Brookings Institution, 29 Apr. 2020.

20 ILO: *Addressing the impact of the COVID-19 crisis on youth employment*, ILO policy brief, forthcoming.

21 See ILOSTAT, ilostat.ilo.org.

22 Recent estimates for the United States indicate that, during a moderate recession which raises unemployment rates by 3 percentage points, the loss in cumulated earnings is predicted to be around 60 per cent of a year of earnings. See H. Schwandt and T. von Wachter: "Unlucky cohorts: Estimating the long-term effects of entering the labor market in a recession in large cross-sectional data sets", in *Journal of Labor Economics* (2019, Vol. 37, No. S1), pp. S161–S198.

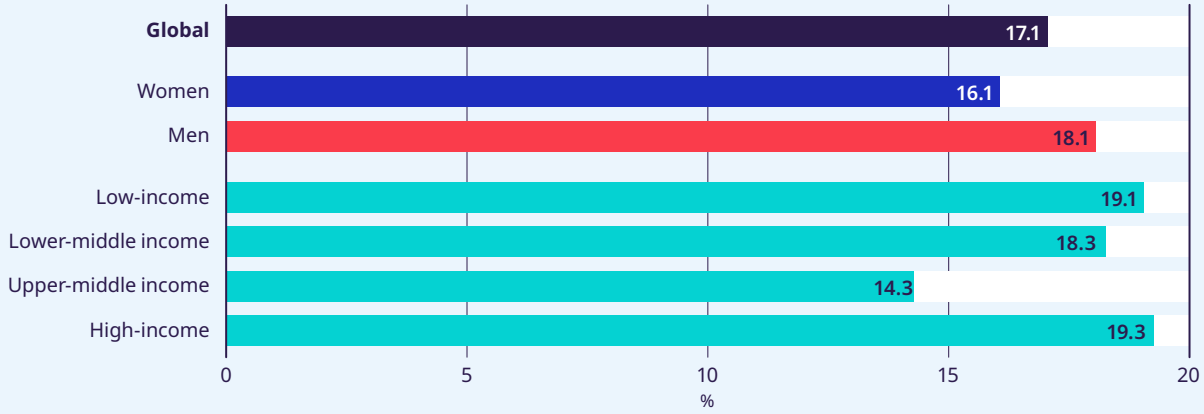
23 See also L.B. Kahn: "The long-term labor market consequences of graduating from college in a bad economy", in *Labour Economics* (2010, Vol. 17, No. 2, April), pp. 303–316.

24 The results presented in this section are based on a preliminary analysis of the data and will be subjected to further examination and robustness checks.

Thus, the preliminary results indicate that over **one in six young people surveyed have stopped working since the onset of the COVID-19 crisis** (figure 6). While this proportion is higher among high-income countries, young workers in countries of all income levels have been heavily affected. For young people who have remained in employment, working hours have fallen by 23 per cent (21 per cent for young women, 24 per cent for young men), and there has also been a widespread impact on incomes, with 43 per cent of young workers reporting a decline since the start of the outbreak. Young men (46 per cent) report a reduction in income more frequently than young women (38 per cent). Almost three in four (71 per cent) young workers who are still employed are working fully or partly from home, with young women (74 per cent) doing so more frequently than young men (68 per cent).

These impacts and uncertainties could take a heavy toll on young people's mental well-being. In this crisis situation, 60 per cent of the young women and 53 per cent of the young men surveyed view their career prospects with uncertainty or fear. Around half of young students report a likely delay in the completion of their current studies, while 10 per cent expect to be unable to complete them at all. On a standardized scale of mental well-being, approximately half of the young people surveyed were assessed as being vulnerable to anxiety or depression since the start of the pandemic.[25] Significantly, young people who have stopped working have the highest risk of anxiety or depression since the start of the pandemic.

Figure 6. Global Survey on Youth and COVID-19: Share of young people (aged 18-29) who reported having stopped working after the onset of the pandemic (%)



Note: The figure shows the share of young people who reported having stopped working since the start of the COVID-19 outbreak relative to all those who had worked before the outbreak.

Source: Global Survey on Youth and COVID-19 (see Technical Annex 3).

25 "Probable anxiety or depression" according to the Warwick-Edinburgh Mental Wellbeing Scales. See https://warwick.ac.uk/fac/sci/med/research/platform/wemwbs/

Policy responses

Immediate support on an unprecedented scale needs to be provided to enterprises and workers around the world across the four pillars of the ILO's policy framework for responding to the COVID-19 crisis (figure 7). This edition of the *ILO Monitor* highlights the urgent need for policy actions that take into account the impact of the crisis on young people so as to avoid losing the productive potential of a whole generation.

- **Investment in testing and tracing does pay off**. T&T is associated with less workplace disruption and can contribute to increased consumer confidence, which in turn should help to stimulate demand. It is important to ensure that any T&T programme is undertaken as part of a government-led initiative and that appropriate safeguards are built into the collection and processing of the data so as to protect the privacy of workers' personal data and prevent unlawful discrimination.[26]
- **Urgent, large-scale and targeted employment policy responses, combined with supportive macroeconomic policies, are needed to prevent the young people of today from becoming a "lockdown generation"**. The crisis will have long-term consequences unless appropriate policy interventions are implemented to reach young people around the world, particularly those most vulnerable during such a severe economic downturn. All policy measures need to address the specific additional challenges faced by young women.

Figure 7. ILO policy framework: Four key pillars in tackling the COVID-19 crisis on the basis of international labour standards

26 For guidance on how to ensure workers' data privacy, see ILO: *Protection of workers' personal data* (Geneva, 1997).

- **Given the risk of long-lasting damage to young people's labour market prospects and to their overall well-being, governments need to provide comprehensive solutions**, combining elements from all four pillars of the ILO's policy framework for tackling the COVID-19 crisis, including support for education and skills development covering digital skills and e-learning, work-based learning, entrepreneurship, social protection and improving rights and conditions in the workplace for young people.[27]
- **The implementation of broad-based employment/training guarantee programmes, where such approaches are feasible, is particularly promising.** The European Union's Youth Guarantee scheme is an example of a counter-cyclical policy that, in times of crisis, delivers a comprehensive and prompt intervention to protect young people from long-term labour market exclusion. By combining support for the entry or re-entry of vulnerable young people to education, training and/or employment with macroeconomic stabilization, such programmes can promote employment recovery as a whole.
- **In low- and middle-income countries, including those experiencing conflict and fragility**, comprehensive responses targeting young people, including employment-intensive programmes and guarantees, are also required, but they have to be adapted to these countries' specific circumstances, and they may need both domestic and external support with regard to financing and implementation.

27 See ILO: *Preventing a lost generation: Addressing the impact of the COVID-19 crisis on youth employment*, ILO policy brief, forthcoming.

Statistical annexes

Table A1. Informal employment among young workers (aged 15–24) and adult workers (aged 25+)

		Percentages (%)			Millions		
		Total	Men	Women	Total	Men	Women
World	Youth (15–24)	76.7	79.0	73.0	328	207	121
	Adult (25+)	59.8	61.6	56.9	1732	1094	638
By income group							
Low-income	Youth (15–24)	95.1	94.2	96.1	74	39	35
	Adult (25+)	83.8	80.2	88.2	182	96	87
Lower-middle-income	Youth (15–24)	91.4	92.5	89.0	149	105	44
	Adult (25+)	83.7	83.9	83.4	822	573	249
Upper-middle-income	Youth (15–24)	69.7	72.0	66.3	91	56	35
	Adult (25+)	53.5	54.8	51.8	625	369	256
High-income	Youth (15–24)	25.2	24.9	25.6	14	7	7
	Adult (25+)	19.4	18.7	20.2	103	56	47
By region							
Africa	Youth (15–24)	93.4	93.0	93.8	97	53	44
	Adult (25+)	80.3	77.1	84.6	294	162	132
Americas	Youth (15–24)	49.2	52.6	44.6	32	20	12
	Adult (25+)	39.3	39.8	38.7	160	92	68
Specifically for Latin America and the Caribbean	Youth (15–24)	64.2	66.1	61.1	28	18	10
	Adult (25+)	52.5	52.2	52.8	130	76	55
Arab States	Youth (15–24)	71.2	72.2	62.6	4	4	0
	Adult (25+)	54.7	55.4	50.2	27	23	3
Asia and the Pacific	Youth (15–24)	84.4	87.5	78.5	183	124	59
	Adult (25+)	68.6	71.4	63.6	1163	774	389
Europe and Central Asia	Youth (15–24)	32.9	33.0	32.8	12	7	5
	Adult (25+)	23.3	22.8	23.8	88	47	41

Note: ILO calculations based on data from 134 countries representing 91 per cent of global employment (76 per cent in Africa, 98 per cent in the Americas, 59 per cent in the Arab States, 95 per cent in Asia and the Pacific, 86 per cent in Europe and Central Asia). Extrapolated to 2020 employment data by age.

▶ Table A2. Young people and adults in informal employment working in the sectors hit hardest by the COVID-19 crisis

		Percentages (%)					Absolute numbers (millions)				
		High risk	Medium-high risk	Medium risk	Low-medium risk	Low risk	High risk	Medium-high risk	Medium risk	Low-medium risk	Low risk
World	**Youth (15–24)**	**40**	**11**	**11**	**33**	**5**	**131**	**37**	**36**	**108**	**16**
	Adult (25+)	35	11	11	37	7	605	182	192	638	114
By income group											
Low-income	**Youth (15–24)**	**18**	**11**	**5**	**64**	**2**	**13**	**8**	**3**	**47**	**1**
	Adult (25+)	20	7	5	65	3	36	13	9	119	5
Lower-middle-income	**Youth (15–24)**	**35**	**10**	**13**	**38**	**4**	**52**	**15**	**19**	**57**	**6**
	Adult (25+)	31	11	9	45	4	258	88	75	367	34
Upper-middle-income	**Youth (15–24)**	**59**	**13**	**12**	**10**	**6**	**54**	**12**	**11**	**9**	**6**
	Adult (25+)	50	12	17	12	9	312	76	108	74	55
High-income	**Youth (15–24)**	**44**	**12**	**10**	**13**	**21**	**6**	**2**	**1**	**2**	**3**
	Adult (25+)	33	14	13	15	25	34	14	13	16	26
By region											
Africa	**Youth (15–24)**	**19**	**11**	**5**	**62**	**2**	**19**	**10**	**5**	**60**	**2**
	Adult (25+)	22	8	5	62	3	64	23	14	183	10
Americas	**Youth (15–24)**	**45**	**18**	**10**	**19**	**8**	**15**	**6**	**3**	**6**	**3**
	Adult (25+)	39	19	11	18	12	62	30	18	29	20
Specifically for Latin America and the Caribbean	**Youth (15–24)**	**43**	**18**	**10**	**22**	**6**	**12**	**5**	**3**	**6**	**2**
	Adult (25+)	38	20	11	22	10	50	26	14	28	13
Arab States	**Youth (15–24)**	**40**	**12**	**10**	**36**	**2**	**2**	**0**	**0**	**2**	**0**
	Adult (25+)	34	14	13	34	5	9	4	4	9	1
Asia and the Pacific	**Youth (15–24)**	**46**	**10**	**13**	**26**	**5**	**84**	**18**	**24**	**48**	**9**
	Adult (25+)	41	10	14	28	6	482	115	168	330	68
Europe and Central Asia	**Youth (15–24)**	**41**	**11**	**10**	**23**	**15**	**5**	**1**	**1**	**3**	**2**
	Adult (25+)	32	12	11	25	21	28	11	9	22	19

▶ Technical annexes

Annex 1. ILO nowcasting model

The ILO has continued to monitor the labour market impacts of the COVID-19 crisis using its "nowcasting" model. This is a data-driven statistical prediction model that provides a real-time measure of the state of the labour market, drawing on real-time economic and labour market data. In other words, we do not define a scenario of how the crisis is unfolding; rather, the information embedded in the real-time data implicitly defines this scenario.

The target variable of the ILO nowcasting model is hours worked, and more precisely the decline in hours worked that can be attributed to the outbreak of COVID-19. To estimate this decline, we set a fixed reference period to use as the baseline, namely the fourth quarter of 2019 – seasonally adjusted. The statistical model produces an estimate of the decline in hours worked during the first and second quarters of 2020 relative to the fixed baseline. Hence, the figures reported should not be interpreted as a quarterly or inter-annual growth rate. In addition, to compute the full-time employment equivalents, based on the percentage decreases, a benchmark of weekly hours worked before the COVID-19 crisis is used. For the present edition of the *ILO Monitor*, we have updated the benchmark to include in the average of hours worked those workers who were temporarily absent from work – in those countries for which such data are available. This has led to a reduction in the hours worked in the baseline period (Q4 2019) in a number of countries. It also means that the same percentage losses in working hours translate into a lower decline in terms of full-time equivalents, as we report for Q1 and Q2 in this edition.

For this edition of the *ILO Monitor*, the information available to track developments in the labour market has increased substantially. In particular, the following data sources have been incorporated into the model: labour force survey data for the first quarter of 2020; administrative data on the labour market – such as registered unemployment – for March; and up-to-date mobile phone data from Google Community Mobility Reports. Additionally, three weeks of data are now available for the second quarter and have been used in the estimates. These include Google Trends data, Oxford Stringency Index data, and data on the incidence of COVID-19. The modelling exercise itself was carried out over a period of several days. The results were finalized on 15 May; the latest data update spanned the period between 11 and 14 May depending on the source.

We have used principal component analysis to model the relationship of these variables with hours worked. Based on available real-time data, we estimate the historical statistical relationship between these indicators and hours worked, and use the resulting coefficients to predict how hours worked will change in response to the most recent observed values of the nowcasting indicators. We evaluate multiple candidate relationships on the basis of their prediction accuracy to construct a weighted average nowcast. For countries where high-frequency data on economic activity are available, but either data on the target variable itself are not available or the aforementioned methodology does not yield a satisfactory performance, the coefficients estimated and results from the panel of countries are used to produce an estimate. Overall, the results are based on high-frequency economic and labour market data for 52 countries.

For the remaining countries, we apply an indirect approach, which involves extrapolating the relative hours lost from countries with direct nowcasts. The basis for this extrapolation is the observed mobility decline from the Google Community Mobility Reports[28] and the index of stringency of COVID-19 containment measures published by the University of Oxford, since countries with comparable drops in mobility and similarly stringent restrictions are likely to experience a similar decline in hours worked. From the Google Community Mobility Reports an average of the workplace and retail & recreation indices is used. The stringency and mobility indices are combined into a single variable[29] using principal component analysis. Additionally, for countries without data on restrictions, we use mobility data, if available, and the updated incidence of the COVID-19 pandemic in each country to extrapolate the impact on hours worked. In view of countries' different practices in counting cases, we use the more homogenous concept of deceased patients as a proxy of the extent of the pandemic. We compute the variable at an equivalent

28 Adding mobility decline as a variable makes it possible to strengthen the extrapolation of results to countries with more limited data. The Google Community Mobility Reports are used alongside the Oxford Stringency Index to account for differential implementation of containment measures. This variable has only partial coverage for the first quarter, and so for the estimates for that quarter only the stringency and COVID-19 incidence data are used. The data source is available at the following link: https://www.google.com/covid19/mobility/.

29 Missing mobility observations are imputed on the basis of stringency.

monthly frequency, but the data are updated daily. The source is the European Centre for Disease Prevention and Control. Finally, for a small number of countries with no readily available data at the estimation time, we use the regional average to impute the target variable. Table A3 summarizes the information and statistical approach used to estimate the target variable for each country.

Because of the exceptional situation, including the scarcity of relevant data, the estimates are subject to a substantial amount of uncertainty. The unprecedented labour market shock created by the COVID-19 pandemic is difficult to assess by benchmarking against historical data. Furthermore, at the time of estimation, consistent time series of readily available and timely high-frequency indicators are still relatively scarce. These limitations result in a high overall degree of uncertainty. For these reasons, the estimates will be regularly updated and revised by the ILO. The two tables below summarize the approach used for each country and the results for selected regions.

▶ Table A3. Approaches used for estimating working hour losses

Approach	Data used	Reference area
Nowcasting based on high-frequency economic data (direct or panel approach)	High-frequency economic data including: labour force survey data; administrative register labour market data; Purchasing Managers Index (country or group); Google Trends data; consumer and business confidence surveys	Argentina, Armenia, Austria, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Canada, China, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong (China), Iceland, Indonesia, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Malaysia, Malta, Mexico, Montenegro, Netherlands, New Zealand, North Macedonia, Norway, Peru, Poland, Portugal, Republic of Korea, Russian Federation, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Kingdom, United States
Extrapolation based on mobility and containment measures	Google Community Mobility Reports (Q2 only) and/or containment stringency index	Afghanistan, Albania, Algeria, Angola, Australia, Azerbaijan, Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belize, Benin, Bolivia (Plurinational State of), Botswana, Brunei Darussalam, Burkina Faso, Burundi, Cabo Verde, Cambodia, Cameroon, Chad, Chile, Colombia, Congo, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Democratic Republic of the Congo, Djibouti, Dominican Republic, Ecuador, Egypt, El Salvador, Eswatini, Ethiopia, Fiji, Gabon, Gambia, Georgia, Ghana, Guam, Guatemala, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Iran (Islamic Republic of), Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Lao People's Democratic Republic, Lebanon, Lesotho, Liberia, Libya, Macau (China), Madagascar, Malawi, Mali, Mauritania, Mauritius, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nicaragua, Niger, Nigeria, Occupied Palestinian Territory, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Philippines, Puerto Rico, Qatar, Republic of Moldova, Romania, Rwanda, Saudi Arabia, Senegal, Serbia, Sierra Leone, Somalia, South Sudan, Sri Lanka, Sudan, Suriname, Syrian Arab Republic, Tajikistan, Togo, Trinidad and Tobago, Tunisia, Uganda, United Arab Emirates, United Republic of Tanzania, Uruguay, Uzbekistan, Venezuela (Bolivarian Republic of), Viet Nam, Yemen, Zambia, Zimbabwe
Extrapolation based on the incidence of COVID-19	COVID-19 incidence proxy, detailed subregion	Bhutan, Central African Republic, Comoros, Equatorial Guinea, Eritrea, French Polynesia, Guinea, Maldives, New Caledonia, Saint Lucia, Saint Vincent and the Grenadines, Sao Tome and Principe, Timor-Leste, United States Virgin Islands
Extrapolation based on region	Detailed subregion	Channel Islands, Democratic People's Republic of Korea, Samoa, Solomon Islands, Tonga, Turkmenistan, Vanuatu, Western Sahara

Notes: (1) The reference areas included correspond to the countries and territories for which ILO modelled estimates are produced. (2) Countries and territories are classified according to the type of approach used for Q2. (3) The results from the study by Bick and Blandin (2020) are used to compute the decline in hours worked for the month of April in the United States. Given Switzerland's economic activity correlation with the eurozone's, the Purchasing Managers Index for the latter is used as an input for that country. Finally, in order to model the impact for China during Q1 the independent variable of the regression (hours lost) and the Google Trends data that are available from Q2 are used in the regression to extrapolate the result for the country. This is because the extrapolation needs to be performed in a quarter in which, on average, the target country is affected in a significant manner. Additionally, given that no new information for China during Q1 has become available since the previous edition of the *ILO Monitor*, the estimate for the first quarter has not been updated.

▶ Table A4. Estimates of drop in working hours in 2020 Q1 and Q2, by region

Reference area	Period	Equivalent number of full-time jobs (40 hours per week) (millions)	Equivalent number of full-time jobs (48 hours per week) (millions)	Percentage hours lost (%)
World	2020 Q1	165	135	4.8
	2020 Q2	365	305	10.7
World: Low income	2020 Q1	4	4	1.7
	2020 Q2	23	19	8.8
World: Lower-middle income	2020 Q1	24	20	1.9
	2020 Q2	140	115	11.4
World: Upper-middle income	2020 Q1	125	105	8.8
	2020 Q2	140	115	9.9
World: High income	2020 Q1	13	10	2.3
	2020 Q2	65	55	12.2
Africa	2020 Q1	8	6	1.7
	2020 Q2	42	35	9.5
Americas	2020 Q1	7	6	1.7
	2020 Q2	60	49	13.1
Americas: High income	2020 Q1	2	2	1.1
	2020 Q2	29	25	16.5
Latin America and the Caribbean	2020 Q1	5	4	1.9
	2020 Q2	31	26	10.9
Central America	2020 Q1	1	1	1.7
	2020 Q2	7	6	8.8
South America	2020 Q1	4	3	2.0
	2020 Q2	22	18	11.8
Northern America	2020 Q1	2	2	1.3
	2020 Q2	28	23	17.0
Northern America: High income	2020 Q1	2	2	1.3
	2020 Q2	28	23	17.0
Arab States	2020 Q1	2	1	2.1
	2020 Q2	8	6	10.3
Asia and the Pacific	2020 Q1	135	115	6.5
	2020 Q2	210	175	10.0
Asia and the Pacific: High income	2020 Q1	1	1	0.7
	2020 Q2	4	4	3.4

▶ **Table A4. (cont.)**

Reference area	Period	Equivalent number of full-time jobs (40 hours per week) (millions)	Equivalent number of full-time jobs (48 hours per week) (millions)	Percentage hours lost (%)
Eastern Asia	2020 Q1	115	95	11.6
	2020 Q2	85	70	8.4
Eastern Asia: High income	2020 Q1	1	1	0.6
	2020 Q2	3	2	2.6
South-Eastern Asia and the Pacific	2020 Q1	5	4	1.4
	2020 Q2	35	29	9.9
South-Eastern Asia	2020 Q1	5	4	1.4
	2020 Q2	33	28	10.0
Europe and Central Asia	2020 Q1	12	10	3.0
	2020 Q2	50	42	12.9
Europe and Central Asia: High income	2020 Q1	9	7	4.2
	2020 Q2	29	24	13.7
Northern, Southern and Western Europe	2020 Q1	8	7	4.3
	2020 Q2	26	22	14.2
Northern Europe	2020 Q1	2	1	3.8
	2020 Q2	6	5	12.2
Southern Europe	2020 Q1	3	3	6.0
	2020 Q2	10	8	17.3
Western Europe	2020 Q1	3	2	3.4
	2020 Q2	11	9	13.3
Eastern Europe	2020 Q1	2	2	1.7
	2020 Q2	15	13	12.0
Central and Western Asia	2020 Q1	1	1	1.8
	2020 Q2	8	7	11.4
Western Asia	2020 Q1	1	1	1.4
	2020 Q2	5	4	11.6
BRICS	2020 Q1	125	105	8.2
	2020 Q2	165	140	10.8

BRICS = Brazil, Russian Federation, India, China and South Africa

Note: Values above 50 million are rounded to the nearest 5 million, values below that threshold are rounded to the nearest million. The equivalent losses in full-time jobs are presented to illustrate the magnitude of the estimates of hours lost. These losses can be interpreted as the estimate of the reduction in hours worked assuming that those reductions were borne exclusively and exhaustively by a subset of full-time workers and the rest of workers did not experience any reduction in hours worked. The figures in this table should not be interpreted as numbers of jobs actually lost or as actual increases in unemployment.

Annex 2. The labour market benefits of testing and tracing

A proxy for testing and tracing intensity

In order to carry out the analysis we need to define a proxy variable for testing and tracing (T&T) intensity. Without any data constraints, we would use a variable that captures the resources devoted to T&T divided by the resources actually needed to implement that strategy. As the numerator, a quality-adjusted index of resources devoted to testing, tracing and isolating cases would be used, divided by population. To scale it, in the denominator, we would use the actual cases of COVID-19 (not only cases actually detected) divided by population, as the resources needed to adequately track and isolate COVID-19 patients can be assumed to grow proportionally with the actual case count.[30,31]

Unfortunately, we do not have access to these types of data. Instead, as a measure of the resources devoted to the T&T strategy, we use the latest number of COVID-19 tests[32] performed at the country level divided by population. The rationale for using this variable is that tracing and other active measures will be positively associated with testing figures; hence, the latter can be used as a proxy for overall intensity of case finding, testing, contact tracing, and isolation and care.[33] As the denominator, we require a measure that serves as a proxy of the incidence of actual cases of COVID-19. Given that the confirmed case count is heavily dependent on the testing practices of each country, we instead use the number of deceased patients divided by the population as a proxy for actual cases.[34] Finally, instead of using the direct ratio we use the natural logarithm of the ratio.[35]

Set-up of the model

To assess the link between T&T and disruption in the labour market we analyse the relationship between the T&T intensity proxy and the estimated loss of hours in the second quarter of 2020 (from the ILO nowcasting model). The relationship between the two variables is assessed using a simple linear regression model. It is worth clarifying that we are trying to assess the total impact of T&T on work activity across all channels in the affected countries, regardless of the differences at the national level in the likelihood of successfully executing such a strategy (e.g. owing to resource/institutional constraints or geographical location). Finally, it should be stressed that the analysis will only identify statistical association and should not be interpreted as a causal inference exercise.

Increasing the sample size

The exercise whose results are presented in the main text uses the highest quality estimates from the ILO nowcasting model – the observations for which high-frequency economic and labour market data are available. However, estimates of working hours lost owing to the pandemic are also available for other countries. The estimates in this case are extrapolated using non-economic data (see Technical Annex 1 for further details). Although restricting the sample to include only the highest quality estimates is a good strategy to avoid bias, it entails the loss of statistical information. The aim of the current exercise is to complement the main specification by using the whole information set available.[36] We carry out the same exercise as described in the main text, fitting a simple linear regression model between the hours lost and T&T variables. Using all estimates of hours lost

30 It is important to emphasize that the inputs used in the T&T strategy are scaled by the incidence of the disease, not by population. The justification for this is straightforward: the T&T level required is proportional to the actual number of cases, for which population is only a potential driver. Critically, this measure is designed for an ex-post analysis; hence, it is perfectly compatible with planning exercises in which the optimal number of tests is proportional to population.

31 Both the numerator and denominator would be divided by population. Arithmetically, this is not necessary because the effect cancels out; nonetheless, it is used for its exposition value.

32 From J. Hasell et al.: "To understand the global pandemic, we need global testing – the Our World in Data COVID-19 Testing dataset", available from the Our World in Data website, last updated 22 May 2020.

33 This is solely due to data limitations on case finding, contact tracing and case isolation, not because such measures are of secondary importance compared with testing. We want to encourage the relevant national authorities to publish and share data on these complementary measures, as they already do for testing data.

34 We are well aware of the limitations in international comparability of practices in registering deceased patients, including limitations related to undercounting and testing. It is important to note that the inverse relationship of T&T intensity with the apparent lethality rate does not prevent the variable from serving as a reasonable statistical proxy for the actual number of cases.

35 We use the logarithm to reduce the effect of heteroscedasticity, which in the current context allows us to reduce the uncertainty associated with our estimate.

36 We do, however, limit the extended sample to countries with available mobility and stringency data (see Technical Annex 1).

available, the country count increases from 45 to 79. The results are very similar: the estimated coefficient using the whole sample stands at –0.009 (slightly lower in absolute terms than the previous estimate of –0.011). However, the increased sample results in a lower estimated uncertainty: the *t*-statistic of the coefficient is now –3.77 (the previous value was –2.95).

An alternative proxy (I) – The inverse of the positivity rate

An alternative proxy for intensity of T&T is analysed in this section. The numerator of the proxy, to measure the resources devoted to T&T, remains the same: tests per population. In the denominator, to measure the resource needs, we use detected cases per capita instead of deceased patients[37] per capita. As mentioned above, this measure is heavily dependent on testing practices at the national level. However, given that using the number of deceased patients also has its limitations, this alternative exercise is an informative complementary analysis. Finally, as in the main exercise, we also take the logarithm of the ratio.

Regressing the percentage of hours lost against the number of tests per inhabitant at the start of the outbreak, we find a substantial effect in loss of hours. In both the restricted sample (with 45 countries with a nowcast based on high-frequency economic data) and the full sample, the average estimated effect is substantial. The effect ranges from 14 per cent (13 per cent in the full sample) in the countries with the lowest levels of initial testing per capita, to 8 per cent in the countries with the highest levels. The uncertainty of the estimates is sizable: the estimated coefficients are –0.011 and –0.007 with *t*-statistics of –1.89 and –2.33, respectively. Nonetheless, the estimated coefficients and ranges are similar to the estimates presented in the preceding section.

Using the alternative proxy has one advantage over the main exercise: it can be used to measure T&T intensity at the early stages of the pandemic.[38] We set this point as a detected number of cases of 1 per million inhabitants. Using the initial stage of T&T is an interesting robustness exercise because it decouples the proxy of T&T intensity from the evolution of the pandemic in a given country. Importantly, a substantial sample reduction occurs (the restricted sample size is now 27 and the full sample size 55) because testing data are not available for many countries for the period before much higher thresholds of detected cases were surpassed. Moreover, there is a strong risk of endogeneity in the missing data pattern, as data seem to be unavailable until a testing programme has begun to be implemented. The results of the exercise are not significantly different from zero; the estimated coefficients are smaller in absolute value: –0.007 and –0.004 (with associated *t*-statistics of –0.64 and –1.06). Still, the estimates of working hours lost remain very substantial in economic terms.

An alternative proxy (II) – A qualitative variable to measure testing and tracing intensity

The Oxford COVID-19 Government Response Tracker (OxCGRT) has two qualitative variables that aim to capture the T&T initiatives launched by governments. For testing, the variable has four categories of testing practices that can be mapped to four different intensity levels. Similarly, contact tracing has three intensity levels. These variables are clearly of interest for the current analysis, because they are explicitly linked to the policies taken and capture both the testing and contact tracing dimensions. On the downside, the qualitative nature of the variables makes them more liable to international comparability limitations. For instance, public reports documenting widespread testing or extensive contact tracing might have very different implications on the ground. Whereas our main specification is of course subject to comparability issues, the quantitative nature of the number of tests and of deceased patients leaves less room for interpretation. Nonetheless, the scope of the OxCGRT data on T&T provides an excellent opportunity to carry out a complementary exercise.

The analysis carried out is a repetition of the main exercise: a simple linear regression model of hours lost as a function of the normative proxies. In order to perform the analysis, we define a dummy variable that will indicate if a given country follows a T&T strategy. The variable takes a value of 1 if testing is available to at least anyone with symptoms and comprehensive contact tracing is implemented and of 0 otherwise. [39] Additionally, we remove countries (representing 5 per cent of the available country count) that are missing a sizeable share of daily observations at the beginning of the sample, and one outlier. The estimated number of hours lost is regressed against the average value of the T&T dummy variable across time. Finally, as in previous exercises, we use the restricted sample of nowcasts (the ones that can be considered more reliable as they use high-frequency economic

37 This proxy of T&T intensity can also be expressed as the inverse of the positivity rate of COVID-19 testing.

38 Deceased counts at early stages of the pandemic are extremely noisy, in particular for smaller countries.

39 The qualitative definitions correspond to the categories of the data source, and their combination reflects reasonably well the strategy of T&T described in the main text.

data) or the full sample. The results are qualitatively similar to the main exercise, particularly in the case of the restricted sample. The estimated ranges from the lowest end of T&T intensity to the highest end are, in terms of hour lost, 11 to 5 per cent for the restricted sample (10.5 to 8.5 per cent for the full sample). The uncertainty is considerably larger than in the main exercise with *t*-statistics associated with the slope coefficients of –2.80 and –2.01, respectively, with country counts of 43 and 139, respectively.

This alternative proxy can also be used to measure T&T intensity at the early stages of the pandemic. We set this point as a detected number of cases of 1 per million inhabitants. Using the initial stage of T&T (to analyse the impact on hours lost in the second quarter) is an interesting robustness exercise because it decouples the proxy of T&T intensity from the evolution of the pandemic in a given country. The results are in this case very similar to the previous ones. The range of the average expected percentage of hours lost is 11 to 6 per cent for the restricted sample, and 10.5 to 8 per cent for the full sample. The associated *t*-statistics are –2.37 and –2.58, with country counts of 37 and 112.

Policy drivers of the effect

In this section, we consider two additional exercises to explore potential policy drivers of the association detected in the main analysis. First, we add as a control variable a measure of institutional quality. To that end we use the World Bank Worldwide Governance Indicators,[40] and in particular the government effectiveness index. This exercise provides insights regarding the degree to which the smaller loss in hours associated with T&T can be explained directly by government effectiveness, which might be correlated with the T&T proxy. The regression results for both the restricted sample (45 countries with nowcast estimates based on high-frequency economic data) and the full sample (78 countries including extrapolations based on other data) barely change in terms of the association of the loss in hours. The estimated slope coefficients remain at –0.0011 and –0.009, and the *t*-statistics change slightly to –2.85 and –3.77. Meanwhile, the government effectiveness variable shows a negative impact on hours lost, albeit with substantial uncertainty (*t*-statistics of –0.26 and –1.23).

Secondly, we add as a control variable the Oxford Stringency Index, which measures the degree of stringency of the measures taken to contain COVID-19. The aim of this exercise is to determine to what extent the smaller degree of labour market disruption associated with T&T is driven by the public policy channel (avoidance or lowering the probability and severity of confinement), in comparison to all the other potential channels. This exercise can only be performed for in the restricted sample (45 countries with direct nowcast and stringency data) because the Oxford Stringency Index is used directly in the extrapolated estimates. The estimated coefficient of association between T&T and hours lost decreases slightly to –0.008. The stringency index, as expected, presents a positive coefficient, of 0.001. The associated *t*-statistics are –2.27 for the T&T intensity coefficient and 3.51 for the stringency coefficient. Both magnitudes suggest the existence of strong association between the two variables.

It should also be noted that the hours lost measure is not directly affected by certain labour market policies taken to mitigate the crisis, such as job retention programmes.

Taking into account the cost of testing and tracing

As mentioned in the main text, very limited data are available to estimate the cost of T&T programmes. Nonetheless, the existing data suggest that T&T interventions are much less costly in comparison with the overall economic consequences of the pandemic. For example, the UK Government recently pledged an additional £5 billion for health and public services as part of the COVID-19 response[41] (this represents 0.25 per cent of annual GDP). By comparison, the Bank of England has predicted a GDP loss exceeding £100 billion in the second quarter of 2020.[42] In this section we discuss available direct evidence concerning the costs of T&T.

First, we need to look at the data available on testing. Overall costs per test have been reported by the media for Germany and the Republic of Korea as €200 and US$135, respectively, while the Centers for Medicare and Medicaid Services in the United States has set the governmental reimbursement rate at US$100.[43] Later reports

40 Available at https://info.worldbank.org/governance/wgi/Home/Documents.

41 HM Treasury: *Policy paper: Budget 2020*, updated 12 Mar. 2020.

42 Bank of England: *Monetary Policy Report May 2020* (London, 2020).

43 M.J. Kim and S. Denyer: *"South Korea is doing 10,000 coronavirus tests a day. The U.S. is struggling for even a small fraction of that"*, in *The Washington Post*, 13 Mar. 2020; A. Freund: *"How does testing for the coronavirus work?"*, *Deutsche Welle*, 4 Mar. 2020; Centers for Medicare and Medicaid Services (CMS): *"CMS increases Medicare payment for high-production coronavirus-lab tests"*, 15 Apr. 2020.

for Germany indicated an overall cost per test of €40, perhaps suggesting a decrease in costs due to economies of scale or innovation.[44] Using the US$135 rate, and considering testing performed up to 1 May 2020, the Republic of Korea's testing programme, which can be regarded as an adequate T&T strategy, would have cost approximately US$80 million (the country's GDP exceeded US$1,600 billion in 2019). Using the same data, Iceland, which has one of the most extensive testing programmes in per capita terms, would, at the highest end of the reported per test cost of €200, have spent US$10.5 million (the country's GDP exceeded US$24 billion in 2019). Looking ahead, although the required level of testing might increase, it is crucial to emphasize that testing is only one part of the detection, tracing and isolation strategy. The testing strategy recommended by WHO[45] is highly targeted.[46] Massive indiscriminate testing, which can be very costly, is probably not required for the proper implementation of an extensive T&T strategy.

The importance of using testing jointly with tracing and case isolation is clear from both a public health perspective[47] and, as we have just argued, an economic perspective. Data for estimating the costs of contact tracing are even scarcer than for testing; hence, the provision of publicly available data on tracing programmes would indeed be very useful. For the United States, it has been estimated that 100,000 contact tracers will be required, at a total cost of US$3.6 billion[48] (around 0.2 per cent of that country's recently approved stimulus package), though some sources have arrived at a much higher estimate.[49] In the United Kingdom, whose population is roughly five times smaller, the Government is considering hiring 18,000 contact tracers.[50] These numbers are certainly considerable,[51] but not daunting. For instance, the 2010 US Census count employed 564,000 workers.[52] The costs of T&T represent just a small fraction of the economic cost that confinement measures entail. Additionally, contact tracing programmes can be a valuable source of (temporary) employment for workers in a depressed labour market (particularly for new entrants), further lowering the opportunity cost of T&T measures.[53]

44 C. Hecking: *"Ungenutzte Corona-Testkapazitäten: Gefährlicher Geiz"*, in *Der Spiegel*, 14 May 2020.

45 WHO: *Laboratory testing strategy recommendations for COVID-19: Interim guidance*, 21 Mar. 2020.

46 It should be noted, though, that the strategy does include a certain element of general epidemiological surveillance.

47 This point was stated clearly in the following recommendation from the report of the WHO–China joint mission on COVID-19 conducted on 16–24 February 2020: "Prioritize active, exhaustive case finding and immediate testing and isolation, painstaking contact tracing and rigorous quarantine of close contacts".

48 Johns Hopkins Center for Health Security: *A national plan to enable comprehensive COVID-19 case finding and contact tracing in the US*, 10 Apr. 2020.

49 H. Yan: "Contact tracing 101: How it works, who could get hired, and why it's so critical in fighting coronavirus now", CNN, 15 May 2020.

50 S. Boseley: "NHS app, testing and contact-tracing: How will the UK's coronavirus plan work?", in *The Guardian*, 28 Apr. 2020.

51 A great deal of attention has focused on the technological tools that could enhance the efficiency of contact tracing and also on the privacy implications of using such tools. As an editorial of 29 April 2020 in the journal *Nature* rightly points out, any technological enhancement of contact tracing has to demonstrate not only its efficacy, but address privacy and safety concerns. Moreover, as the same editorial makes clear, in those countries where technological tools may have contributed to success there was already a strong T&T programme in place. In any case, although technological advances may help teams of contact tracers to increase their productivity, they are not a prerequisite for executing the T&T strategy.

52 E. Richards: "The 2010 Census: The employment impact of counting the nation", in *Monthly Labor Review*, March 2011, pp. 33–38.

53 ILO: *COVID-19 and the health sector*, briefing note, 20 Apr. 2020.

Annex 3. The Global Survey on Youth and COVID-19

The Global Survey on Youth and COVID-19 was designed by the ILO and partners of the Global Initiative on Decent Jobs for Youth, including the United Nations Major Group for Children and Youth, AIESEC, the European Youth Forum, the European Union Emergency Trust Fund for Africa and the Office of the United Nations High Commissioner for Human Rights. The online survey was conducted from 21 April to 21 May 2020, with the participants recruited globally through online snowball sampling (non-probabilistic). As at 21 May 2020, the survey, available in 23 languages, had been completed by 13,938 individuals aged between 18 and 39 years. After further cleaning of the data, the final sample consists of 13,329 observations. The respondents in the final data set represent 112 countries across all ILO regions and income groups.

The data set is broken down into a 18–29-year-old youth cohort (11,179) and a 30–39-year-old comparison cohort (2,150). A significant majority of respondents (64 per cent) are women, and most fall within either the 18–24 age bracket (61 per cent) or the 25–29 age bracket (23 per cent). Around 60 per cent of respondents have attained a tertiary level of education and 27 per cent at least secondary-level qualifications.

Throughout the analysis, population weights were used to correct for differences in age and sex between the survey respondents and the general country population with a similar profile of educational attainment. Weights are based on ILOSTAT data on working-age population disaggregated by age (18–29 years, 30–39 years), sex and education for all available member States.[54] To address the considerable variation in the numbers of observations per country, results are weighted at the level of geographical regions and income groups.[55] The results presented in this edition of the *ILO Monitor* are based on a preliminary analysis of the data and will be subjected to further examination and robustness checks.

54 For countries where the required population breakdown was unavailable, weights were imputed on the basis of data from countries in the same income group and region. A total of 609 responses were discarded because either weights could not be calculated or too few (below 10) responses were provided by a given country.

55 Based on income groups (4) and ILO geographical regions (5), each respondent was assigned to one of 20 country groups, further divided into cells based on age cohorts (18–29 years, 30–39 years) and sex (women, men). Weights equal the sum of the population represented in a given cell (by all countries of the respective income-regional group) divided by the number of survey respondents in that cell. This procedure makes it possible to avoid assigning high weights to respondents from countries with relatively few observations compared with the country population.