



► ILO Brief

June 2021

COVID-19, vaccinations and consumer demand: How jobs are affected through global supply chains*

Key points

- COVID-19 led to a severe decline in global consumer demand for manufacturing products that has only recovered partially in most countries so far. Lockdown measures, economic uncertainty and income losses contributed to this decline. Despite surges in consumer demand for specific products, such as electronics, overall demand remains below the pre-crisis growth path in large parts of the world. The impacts have adversely affected jobs within the global supply chains linked to manufacturing production.
- In April 2021, an estimated 97 million jobs in global supply chains experienced high negative impact due to the decline in consumer demand for manufacturing products worldwide. Around 107 million jobs were hit with medium impact. Taken together, this corresponds to nearly one in three jobs in global supply chains for manufacturing that are likely to have experienced termination, working-hour reduction, labour income reduction or other deteriorated conditions. This includes jobs in all economic sectors.
- The crisis peaked in April 2020, when nearly 570 million jobs in the global supply chains for manufacturing faced either high or medium adverse impacts. The situation steadily improved between May and October 2020 but has since worsened again. The number of jobs adversely impacted by the decline in consumer demand has been on the rise since October.
- The Europe and Central Asia region and the Africa and the Arab States region have the largest shares of highly impacted jobs relative to all jobs in global supply chains for manufacturing. Asia and the Pacific have the largest share relative to total employment. By income group, the larger shares of highly impacted jobs are in lower-middle-income countries. Global garment supply chains have the greatest number of jobs experiencing high adverse impact, followed by motor vehicle supply chains.
- Many low- and middle-income countries only have limited resources and access for procuring vaccines. This situation puts at risk tens of millions of jobs worldwide which depend on consumer demand for manufacturing products from these countries. This includes jobs in countries that are progressing well in their vaccination programmes. International solidarity in rolling out vaccines and in mitigating the crisis impacts are imperative.
- The pandemic highlights the urgent need to invest in both the economic and social upgrading of global supply chains. Support for enterprises and workers is required to undertake the transition to supply chains with higher crisis resilience and that are based on more sustainable consumption patterns. Resilient, inclusive and sustainable supply chains are key to building back better.

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► Introduction

The COVID-19 pandemic led to a severe decline in consumer demand. As the pandemic spread around the world, different countries experienced decreases in consumer demand and rebound effects at different times, some of them short-lived. With global production interlinked through global supply chains, the effects on economies reached beyond national borders. While consumer demand for some products, including electronics and chemicals items, actually surged, overall retail sales in large parts of the world remain considerably lower than would be expected on the basis of the pre-crisis trend, with adverse impacts lingering on enterprises and the jobs that they provide to millions of workers.

This brief assesses the impact of the decline in consumer demand for a large number of manufacturing products on jobs in the global supply chains that link to the production of those goods, building on a previous analysis (ILO 2020a).¹ The estimates cover employment in 64 countries, accounting for more than 74 per cent of the global labour force, during the period from January 2020 to February 2021.² The jobs considered reflect the entire supply chains of manufacturing products in all sectors and countries, including direct and indirect as well as national and international supply chain linkages. It also includes jobs in the services and agriculture sectors that provide inputs for manufacturing production.

This brief is premised on the reality that if consumer demand for manufacturing products deflates in one country, jobs that link to the production of those goods through global supply chains, located in the same country or elsewhere, may suffer an adverse impact. All these jobs are counted in the estimates used here.³ As production drops, workers feel the effects through working-hour and labour-income reduction and, in some instances, job loss.

The analysis classifies different manufacturing sectors four ways: those experiencing a high, medium, low or no adverse crisis impact on consumer demand for their products, dependent on the market in which consumers

make their purchases. This impact assessment is based on data on retail sales growth and working-hour losses at the country and sector levels. The analysis then uses international input-output tables to identify the jobs in different sectors and countries, which link to the corresponding consumer demand (see Annex 1 for methodological details).

The brief also assesses the impact of the current and projected unequal progress in vaccinations around the world on jobs in the global supply chains for manufacturing. Specifically, it assesses the number of jobs that are likely to remain at higher risk due to their dependence on consumer demand from countries, where vaccination roll-out is slow. These countries are likely to remain particularly vulnerable to new waves of the pandemic, with a risk of continued adverse impact on consumer demand due to lockdown measures and low consumer confidence. This in turn risks continuing impact on jobs worldwide that link to the production of manufacturing goods for consumption in these particular markets.

This brief focuses on one channel of impact – the decline in consumer demand for manufacturing products – and one channelling mechanism – global supply chains. This includes all sectors and countries forming the supply chain. The analysis does not cover other impact channels, such as the input supply disruptions due to the workplace closures that governments continue to require.⁴ And it does not cover the impact of declining demand for services.

The pandemic struck when global production networks were experiencing rapid change. Trade policies were one source of change, with trade protection reaching historical levels (WTO 2019). Digitalization and automation also were under way well before the pandemic and are now expected to be among the drivers of economic recovery (Fu 2020).

¹ The approach adopted in this brief to define jobs in global supply chains that link to the production of manufacturing goods closely follows Timmer et al. (2015), who referred to “manufactures global value chains”. The jobs considered in this brief include both formal and informal employment.

² See Annex 1 for a full list of countries included in the estimates.

³ Cross-border impacts are likely to have been substantial, given the observed decreases in foreign direct investment and trade (ILO 2021c)

⁴ More recently, closures have been geographically targeted and sector-specific, compared with the nationwide measures applied earlier in the pandemic (ILO 2020a; ILO 2021a).

Enterprises are now striving to create more resilient supply chains to increase their preparedness for future crises. Transitioning to more resilient, inclusive, climate-friendly and sustainable supply chains is key to building back better. Supporting enterprises and workers through this transition will be one of the main tasks of policymakers in the years to come. Social dialogue between governments, enterprises and workers is needed to find sustainable solutions for helping enterprises and workers navigate through this unprecedented time.

Structure of the brief

The next section looks at how the decline in consumption is affecting jobs that are linked to the demand for manufacturing products. The section thereafter focuses on the role of the vaccine roll-out and its impact on those jobs. The final section discusses policy options for the way forward.

► Declining consumer demand for manufacturing products continues to hit jobs worldwide

Consumer demand remains down in large parts of the world

More than one year into the COVID-19 crisis, consumer demand has recovered at least partially in some parts of the world. It remains depressed in many others. Some countries experienced a rebound in consumer demand for a few weeks or months until they were struck by a new wave of COVID-19 cases. The situation has been dynamic and often unpredictable.

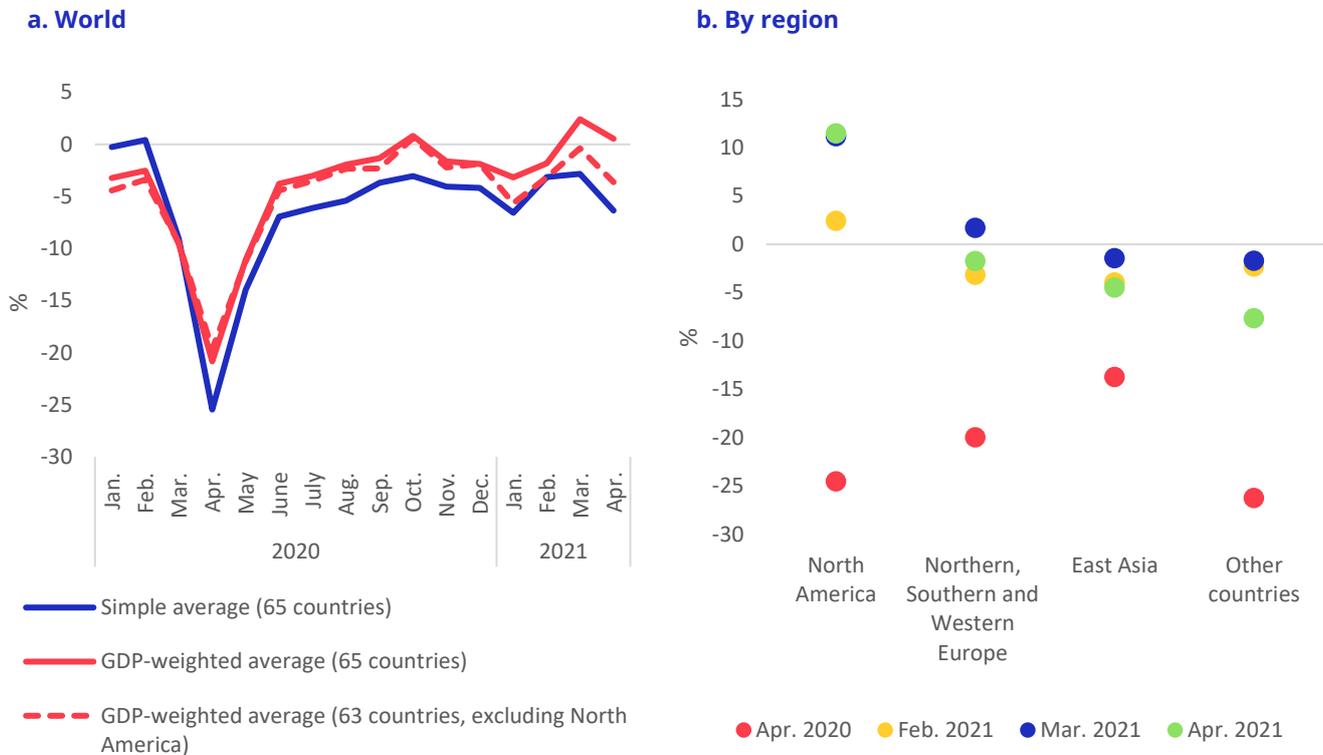
In 65 countries with available data, the simple average of retail sales in April 2021 was 6.4 per cent lower than the pre-crisis growth path., while the GDP-weighted average was 0.5 per cent higher (figure 1a). The latter was entirely driven by North America, without which the GDP-weighted average of retail sales was 3.6 per cent lower. Retail sales in most countries are still considerably below the value that would have been reached had they grown as fast as indicated by the pre-crisis patterns. The crisis thus continues to have adverse impact even though the situation has improved since April 2020, when nationwide lockdown measures were most comprehensive and strict in most countries. At that time, retail sales had dropped by

25.5 per cent (simple average) and 20.8 per cent (GDP-weighted average).

Different consumer markets have exhibited significant differences in trends (figure 1b). In North America, retail sales fully recovered in early 2021 to values above the pre-crisis growth path, suggesting some catch-up in demand. Stimulus packages adopted in the United States of America are likely had a major role in steering up consumer confidence and purchasing power in that region (Mutikani 2021).

Trends have been different in East Asia, where retail sales in early 2021 remained below their pre-crisis growth path. Still, there has been a gradual and partial rebound in demand, mainly driven by China, following the strong adverse impact that the region experienced in the early stages of the pandemic. However, evidence indicates that many consumers in China are still holding to a cautionary approach on spending (Brennan 2021; Lee 2021; Stevenson and Li 2021). Northern, Southern and Western Europe were seeing a recovery of consumer demand in late 2020 until it sharply deteriorated in early 2021, when many countries in Northern, Southern and Western Europe were forced to return to strict lockdown measures to counter a new wave of the pandemic, fueled by a more contagious variant of the virus.

► **Figure 1. Monthly retail sales around the world and by region** (percentage difference from pre-crisis growth path)



Note: Data for January to December 2020 are based on 65 countries. In the remaining months, the number of countries included reduced gradually to 59 countries in March 2021 and 41 countries in April 2021. However, the results are similar when only including countries with data available for all months. Data included in this figure covers countries that are covered by the estimates presented in this brief, as well as countries that are not. The pre-crisis growth path of retail sales corresponds to the growth path, based on retail sales growth in 2017–19. Panel b shows the GDP-weighted average of the percentage different from the pre-crisis growth path.

Source: ILO calculations based on Trading Economics.

These trends show that the situation remains highly volatile and may vary considerably between countries and regions at a given point in time, with impacts on enterprises and jobs (Zhang 2021). Previous experiences suggest that what appears to be a recovery in consumer demand can, in some instances, be short-lived. The sustainability of the recovery crucially depends on a country's ability to suppress new waves of the pandemic.

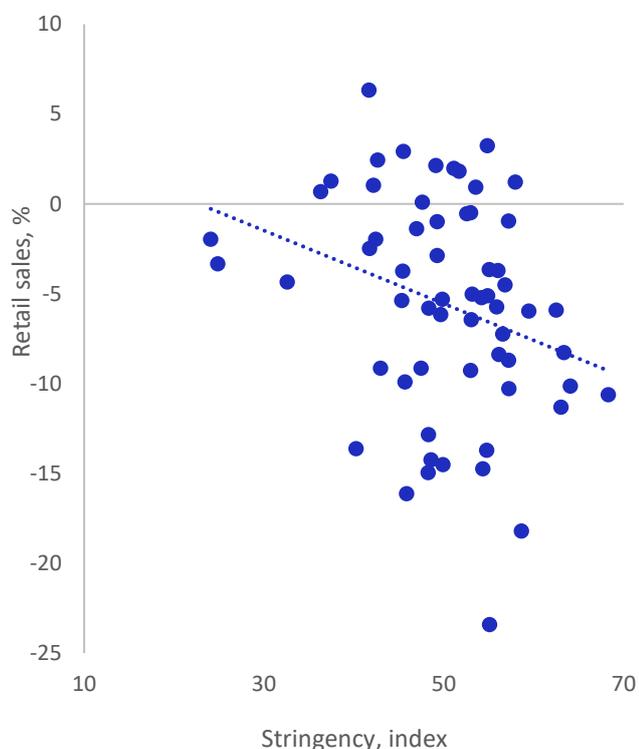
Measures to prevent the spread of the pandemic and income losses continue to depress demand

Lockdown measures such as travel restrictions or closure of businesses or production facilities remain in place in many countries or parts thereof. While lockdown measures are needed to contain the spread of the virus, they appear to be among the factors that negatively weigh on consumption. There is a clear and statistically significant correlation between the stringency of lockdown

measures and retail sales: The stricter were the lockdown measures to combat the virus in 2020, the larger was the difference of retail sales to their pre-crisis growth path (figure 2).

Even when physical businesses remained open (throughout 2020 and into 2021), the strict hygiene measures and physical distancing rules limited the number of customers indoors at the same time. Some people, especially those in risk groups who are unvaccinated, still avoid contacts for fear of catching the virus. This also has reduced in-person shopping. An upward jump in e-commerce retail sales has partially offset that decline, as reflected in available data for a large number of countries, including China and the United States (UNCTAD 2021). Estimates indicate that worldwide retail e-commerce sales grew by 27.6 per cent in 2020, compared with 2019 (Cramer-Flood 2021). However, the overall decline in retail sales (figure 1) indicates that e-commerce was not able to fully replace the in-person shopping declines.

► **Figure 2. Retail sales (percentage difference from pre-crisis growth path) and stringency of lockdown measures (index) in 2020**



Note: The chart covers data for 61 countries. Each dot corresponds to one country. The values for retail sales (difference from pre-crisis growth path) and stringency index are based on the simple average of these variables over all months of 2020. The relation between the two variables is statistically significant, at the 5 per cent level.

Source: ILO calculations based on the Oxford COVID-19 Government Response Tracker database and Trading Economics.

Job and income losses, reduced working hours and reliance on government support have become a reality for millions of workers and consumers. These losses and reductions are impeding the full recovery of consumer demand. The International Labour Organization (ILO) estimates that 8.8 per cent of working hours globally were lost in 2020, owing to the pandemic. This translates to losses in income and livelihoods for millions of workers and consumers (ILO 2021a; ILO 2021b). In such a climate and with economic uncertainty continuing, many consumers prefer to accumulate savings if they can and thus avoid unnecessary spending.

A quick and full recovery of global retail sales appears unlikely. Projections of global working hours lost for 2021

are still sizeable, with estimated working-hour losses of 3.5 per cent in the baseline scenario. Even in the most optimistic scenario, 2021 will see working-hour losses and associated labour-income losses (ILO 2021b). Vaccinations are only progressing gradually, and not all countries have equal access to vaccines (see the next section). With this outlook, it is unlikely that global economic activity will reach pre-pandemic levels very soon, suggesting a continued strain on the purchasing power of consumers worldwide in the months to come.

The decline in overall retail sales hides important differences in the impact between sectors and product groups. Some products have seen surges in consumer demand, with enterprises struggling to meet demand. This has even led to global shortages in inputs, with impacts spilling across sectors.⁵ The COVID-19 crisis likely will result in long-lasting shifts in consumer behaviour and preferences, with different impacts on the demand for different products (Remes et al. 2021). However, overall consumer demand remains depressed in large parts of the world, with an overall decline in retail sales in many countries as a consequence.

A decline in consumer demand for a particular manufacturing product implies a decline in sales, which negatively impacts jobs related to the production of those goods. This includes jobs at every stage of the production process for manufacturing goods, from workers involved in the collection and production of raw materials to workers providing services along the supply chain and workers directly employed in manufacturing. Jobs in all countries that take part in a production process are covered. All these jobs are referred to in this brief as jobs in global supply chains for manufacturing.

More than 200 million jobs in global supply chains for manufacturing suffer from high or medium adverse impacts

Overall, there is an estimated 615 million jobs in global supply chains for manufacturing – approximately 25 per cent of total employment in the 64 countries covered by the analysis. In April 2021, an estimated 97 million (16 per cent) of these jobs endured a high negative impact due to

⁵ One recent example is the semi-conductor crisis, in which strong consumer demand for electronics was among the major factors that led to a shortage in computer chips, which also affected car manufacturers, of which some even had to temporarily halt production (Sweney 2021).

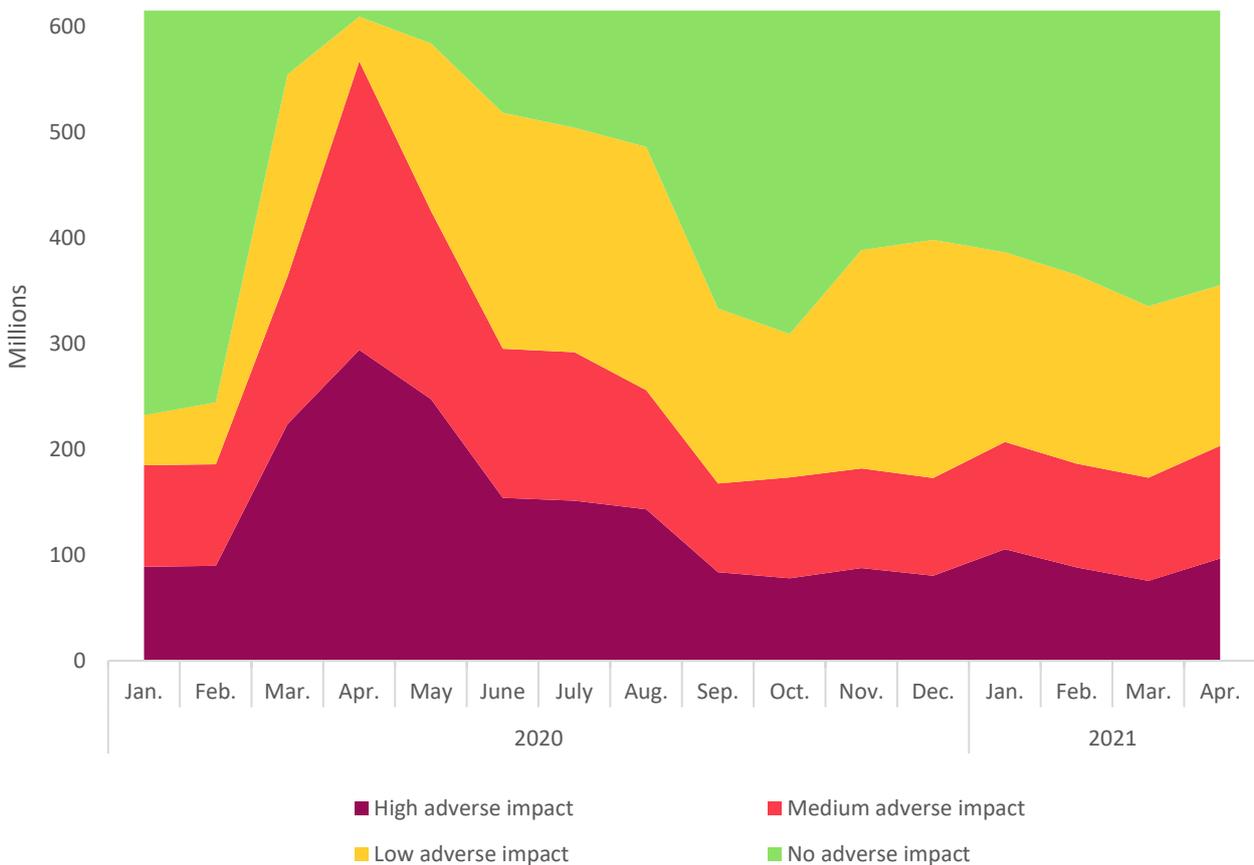
a drop in consumer demand for manufacturing products (figure 3). This corresponds to a share of 3.9 per cent in total employment in these countries (figure 4). These jobs are estimated to either have been completely lost or to have suffered substantially from reduced working hours, income losses or other downward pressures on labour standards and working conditions.

As many as 107 million jobs endured medium negative impact as of April 2021. When combined, this amounts to nearly one in three jobs in global supply chains for manufacturing that had experienced either high or medium adverse impact, accounting for 8.3 per cent of

total employment. An estimated 152 million jobs experienced low adverse impact. Around 260 million jobs did not experience any adverse impact.⁶ These estimates suggest that global manufacturing supply chains remain under considerable strain.

Compared with April 2020, when almost 570 million jobs (nearly all jobs in global supply chains for manufacturing) endured either high or medium adverse impacts, the jobs situation has improved substantially. However, the situation in April 2021 was slightly worse than in October 2020, when the overall number of jobs experiencing an adverse impact reached its low point to date.

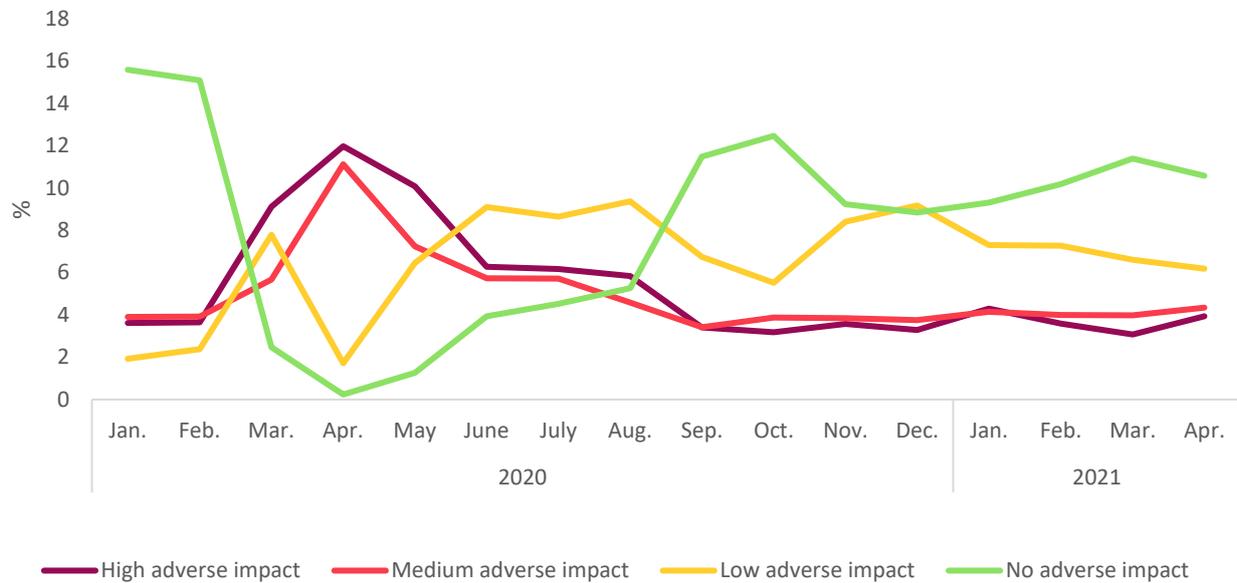
► **Figure 3. Number of jobs in global supply chains for manufacturing, by impact (millions)**



Source: ILO estimates. See Annex 1 for more details.

⁶ This also might include some jobs that experienced positive impact due to the increase in consumer demand for some products. However, there might have been instances in which the struggle to meet demand led to excessive working hours. There are also reports of poor working conditions in rubber glove manufacturing, for instance, where migrant workers are particularly vulnerable to exploitation (Harper 2020).

► **Figure 4. Share of jobs in global supply chains for manufacturing, by impact (percentage of total employment)**



Source: ILO estimates. See Annex 1 for more details.

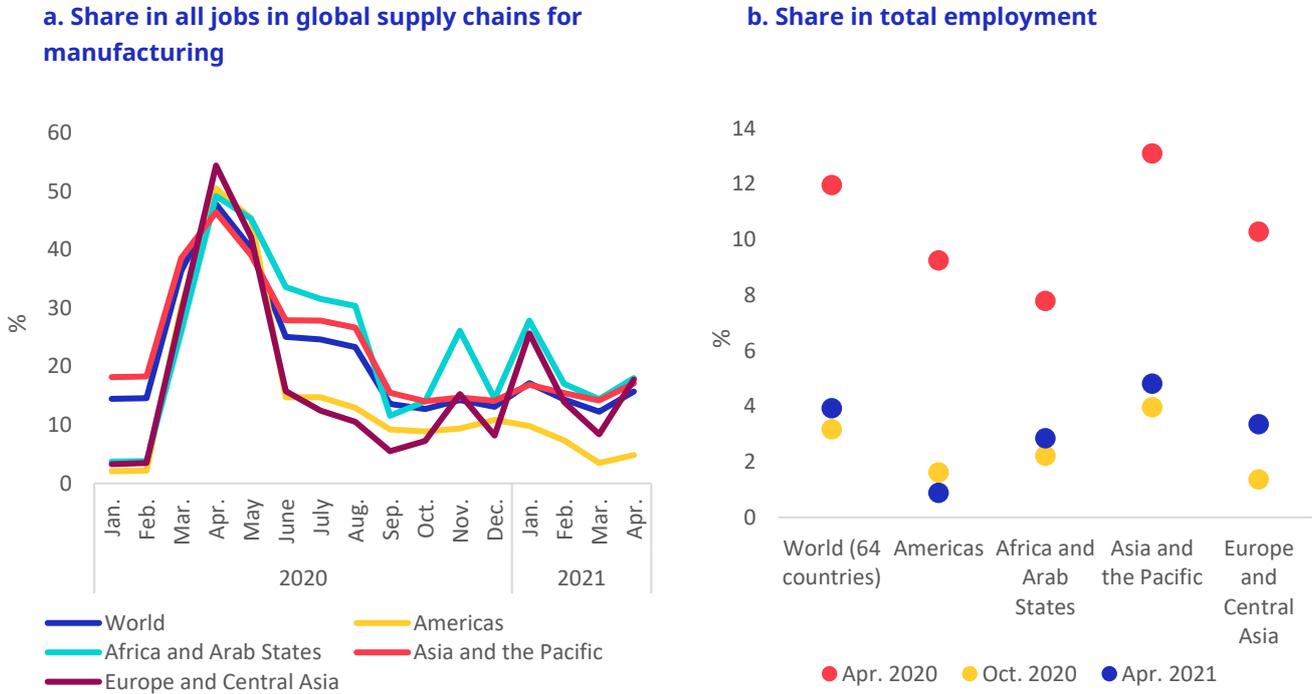
The impact is strongest in lower-middle-income countries

The jobs impact due to the pandemic crisis varies between geographic regions. In April 2021, the largest share of jobs in global supply chains for manufacturing that suffered from a high adverse impact was in Europe and Central Asia and in Africa and the Arab States, reaching 18 per cent in both regions (figure 5a). This share had been fluctuating considerably in both regions over the past months. Asia and the Pacific and the Americas have only had small changes over time in their respective shares. The Americas, while suffering heavily from the pandemic generally (ILO 2021a), was the second-most impacted region during the crisis peak in April 2020 but is now the least impacted region. The recovery of consumption in the United States may be driving this situation partially due to a large number of jobs linked to the corresponding supply chains also located in that region.

Relative to total employment, the Asia and Pacific region has had the largest share of highly impacted jobs throughout the pandemic (figure 5b). This is not surprising, given that the region, often called “Factory Asia, remains an epicentre for the production of goods consumed all over the world (ADB 2013). While that share of highly impacted jobs peaked in April 2020 at 13 per cent, it was 4.8 per cent in April 2021.

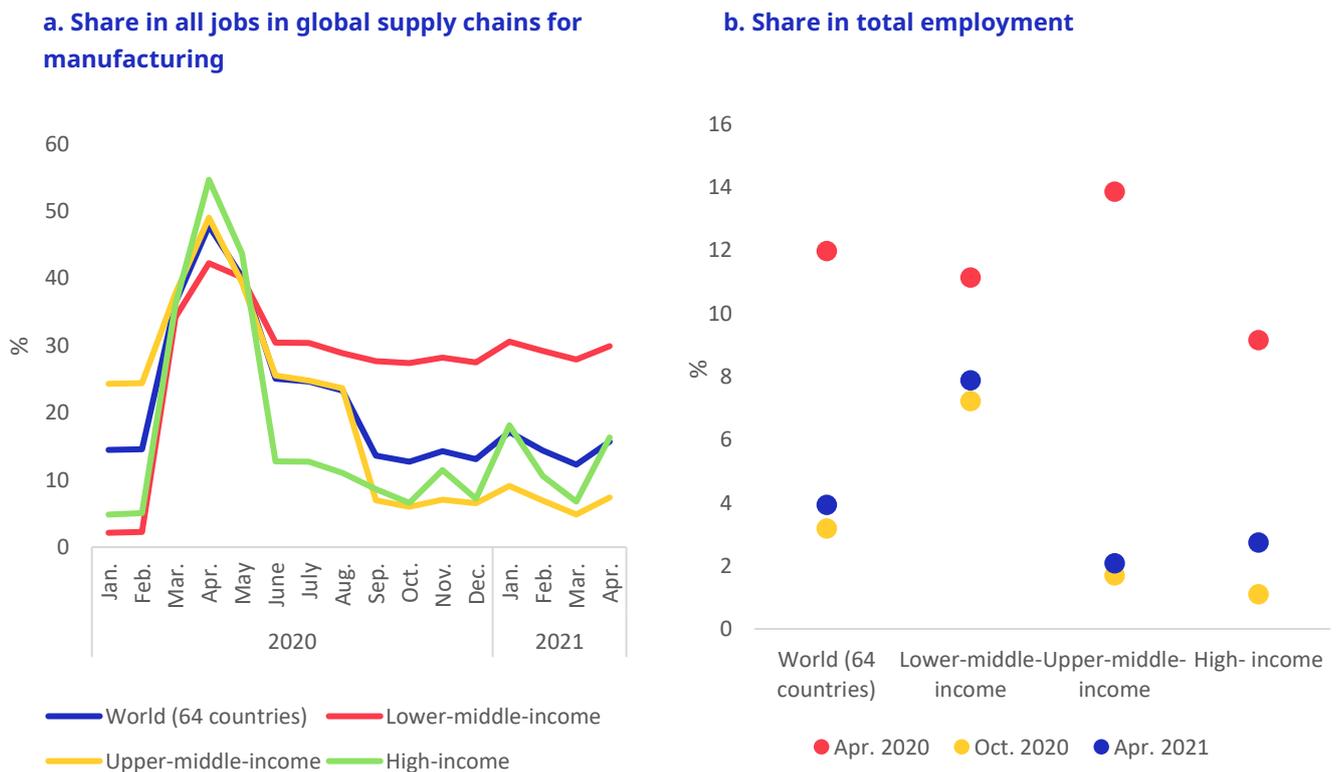
When looking at countries by income status, the most impacted in April 2021 were lower-middle-income countries. Such countries endured the larger shares of highly impacted jobs, both relative to all global manufacturing supply chain jobs (30 per cent) and relative to total employment (8 per cent) (figures 6a, 6b). The lower-middle-income countries were less affected in earlier phases of the pandemic, but now appear to be the gravity centre of impact.

► **Figure 5. Share of jobs experiencing high impact, by geographic region (percentage)**



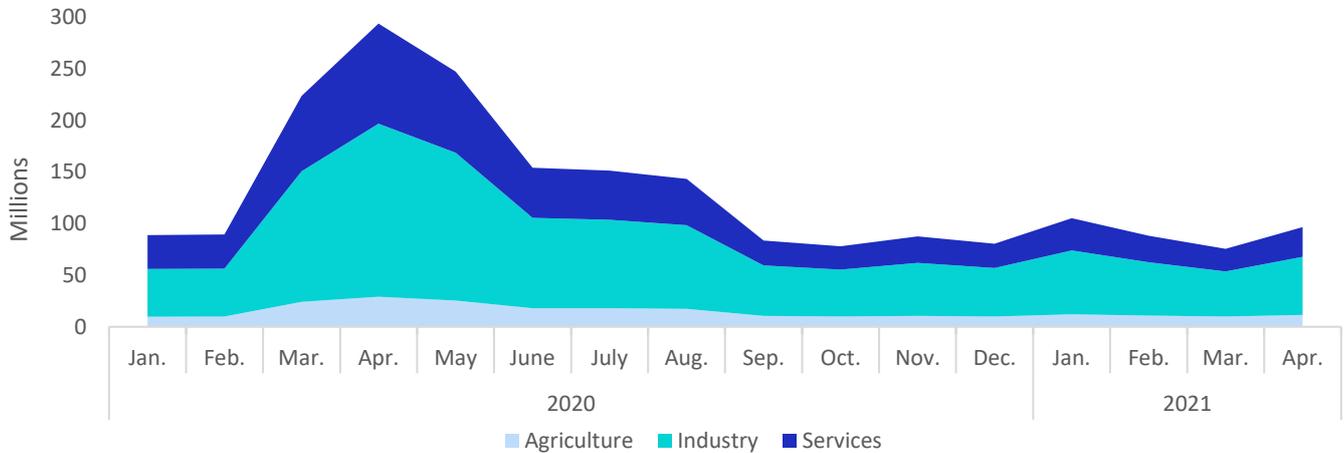
Note: Estimates for Africa and Arab States are not representative and based on four countries only.
Source: ILO estimates. See Annex 1 for more details.

► **Figure 6. Share of jobs experiencing high impact, by country income status (percentage)**



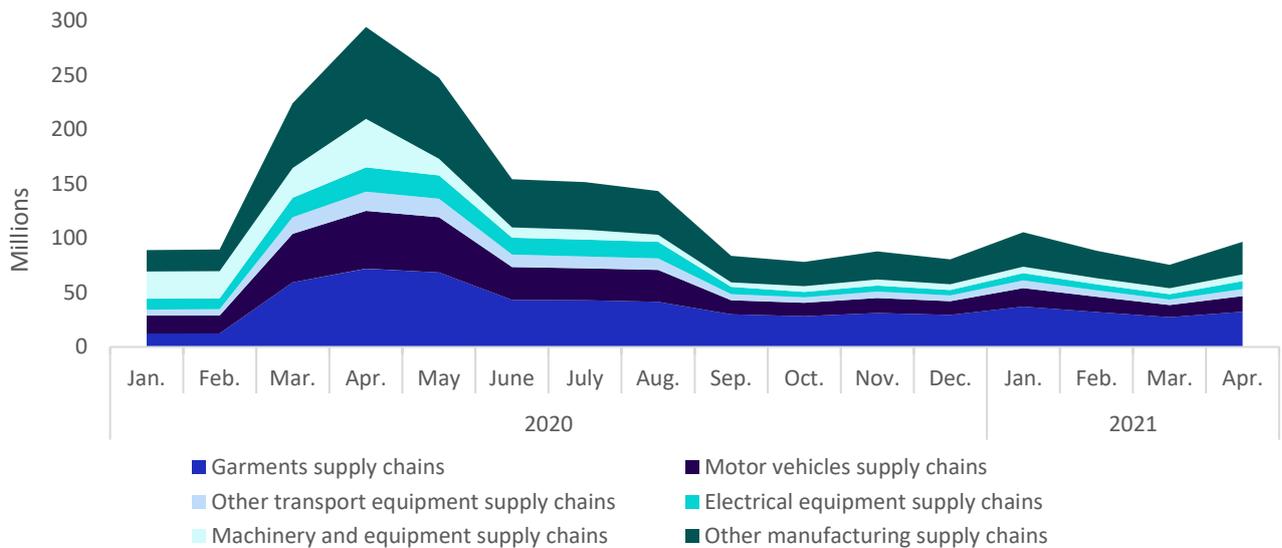
Source: ILO estimates. See Annex 1 for more details.

► **Figure 7. Number of highly impacted jobs in global supply chains for manufacturing, by broad sector (millions)**



Source: ILO estimates. See Annex 1 for more details.

► **Figure 8. Number of highly impacted jobs in global supply chains for manufacturing, by supply chain (millions)**



Source: ILO estimates. See Annex 1 for more details.

The decline in consumer demand for manufacturing products has affected jobs in all sectors

In April 2021, most of the 97 million jobs highly impacted by pandemic-related declines in consumer demand were in manufacturing or other industrial sectors (56 million jobs). But jobs in the services sector (29 million) and the agriculture sector (12 million) also experienced high

negative impact due to the collapse in consumption (figure 7). The share of jobs with high adverse impact was lowest in the agriculture sector, where only a relatively small percentage of all agriculture jobs in the global supply chains for manufacturing (6 per cent) experienced a high adverse impact. The agriculture sector mainly produces inputs for food and beverage production, which remained in demand as essential goods and thus less disrupted.⁷

⁷ Only the agri-food sector did not experience any significant decline in international trade, even during the peak of lockdown measures in April 2020 (UNCTAD 2020).

Jobs in the global supply chains for garments and cars continue to see adverse impacts

The impact of a decline in consumption differs depending on the manufacturing product and the global supply chain related to its production. In April 2021, 32 million jobs in global supply chains for garments experienced a high adverse impact (44 per cent of all jobs in the global supply chains for garments) (figure 8 and 9). Earlier, during the peak of lockdown measures in April 2020, 72 million jobs in the global supply chains for garments experienced a high impact (98 per cent of all jobs in the global supply chains for garments) (see also ILO 2020b). The relatively high working-hour and employment losses in the garment sector itself (see box 1) confirm that garment supply chains are among the manufacturing supply chains that experienced a heavy impact.

In April 2021, 15 million jobs in global supply chains for motor vehicles (or 27 per cent of all jobs in the global supply chains for motor vehicles) still faced high negative impact due to the drop in consumer demand. Ten months earlier, in April 2020, this number was 53 million (98 per cent). The situation in the motor vehicle sector and its related supply chains has improved considerably – more than in other sectors, such as the garment sector. One stimulating factor is the partial recovery of consumer demand in China (Moss 2021). Although, as previously noted, the semi-conductor crisis that resulted in shortages of semi-conductors (an input for car production) heavily impacted this supply chain.

In addition to garments and motor vehicles, millions of jobs related to transport equipment, electrical equipment, machinery and other equipment and other manufacturing supply chains continue to face high adverse impacts.

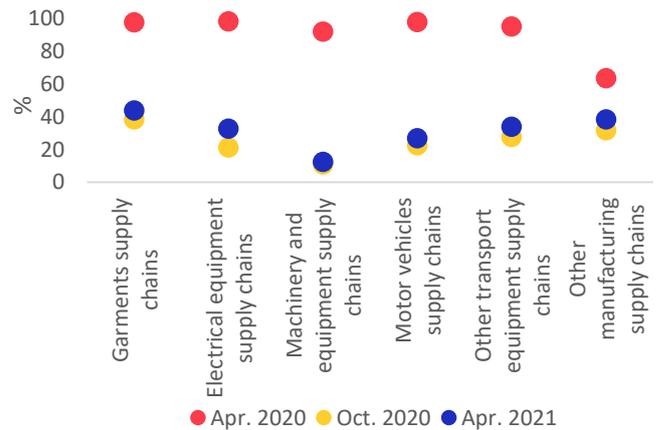
Women held roughly one in three highly impacted jobs

The garment and electronics supply chains employ the larger shares of women workers. While the garment sector and its supply chains have taken a substantial hit, there has been a surge in demand for electronics products. Overall, women’s share in jobs experiencing a high adverse impact was 32 per cent in April 2021. In all global manufacturing supply chains that suffered adverse

impact, regardless of the magnitude, women accounted for 36 per cent of jobs (figure 10).

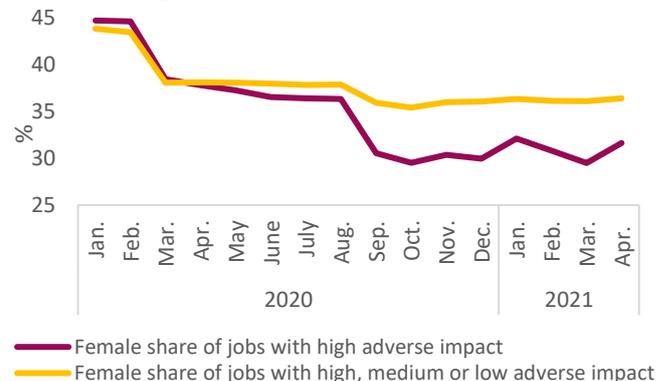
Over time, there has been a declining trend in these shares. Especially in the first quarter of 2020, relatively more women experienced either high, medium or low adverse impacts. This is in part because the epicentre of the crisis at the time was in East Asia and South-East Asia. Consumer demand in these regions is, to a large extent, served by regional supply chains; the share of women in related jobs is larger than elsewhere. This is also supported by ILO estimates on the share of women employed in the manufacturing sector, which stood at 45 per cent in East Asia and at 48 per cent in South-East Asia, compared with the global share of 38 per cent.⁸

► **Figure 9. Share of highly impacted jobs in all jobs in global supply chains for different manufacturing sectors, by supply chain (percentage)**



Source: ILO estimates. See Annex 1 for more details.

► **Figure 10. Female share of adversely impacted jobs in global supply chains for manufacturing (percentage)**



Source: ILO estimates. See Annex 1 for more details.

⁸ ILO estimates are taken from ILOSTAT, accessed 30 April 2021.

Box 1

Widespread working-hour and employment losses in the manufacturing sector

When consumer demand for a particular manufacturing product drops, it affects jobs in sectors that provide inputs for its production. For example, reduced consumer demand for garments affects jobs in the garment sector, in the chemicals sector that produces the dyes used in textiles and in the agriculture sector that supplies cotton and other natural fibres. The most affected sector, however, is the particular manufacturing sector, which the product is classified into. This box presents working hour and employment losses in different manufacturing sectors.

The manufacturing sector as a whole has been one of the most affected sectors during this COVID-19 crisis, with working-hour losses of 11.9 per cent in 2020 Q2 and 4.4 per cent in 2020 Q3 and employment losses of 5.6 per cent in 2020 Q2 and 2.5 per cent in 2020 Q3 on average for a sample of 49 countries (ILO 2021a). However, there are some important differences between manufacturing sectors in the data for 17 countries for which working-hour and employment losses can be calculated (see table 1 below).

The garment sector was among the most affected sectors in 2020 Q2 and Q3, with devastating working-hour losses in countries with available data. Other sectors, such as wood products or fabricated metals, also experienced strong negative impact in these two quarters. This might be because they provide inputs to the construction sector, which has had heavy losses (ILO 2021a). In contrast, workers in chemicals, pharmaceuticals and electronics have been considerably less affected on average. Demand for products such as gym equipment or sanitizers has surged (Shaban 2021; Taylor 2020). Still, overall working-hour and employment losses were quite widespread within the manufacturing sector during 2020 Q2 and Q3.

► **Table 1. Year-on-year changes in working hours and job losses, by sector**

Manufacturing sector	ISIC Rev. 4 division	Year-on-year changes in working hours (percentage)		Year-on-year changes in employment (percentage)	
		2020 Q2	2020 Q3	2020 Q2	2020 Q3
Garments	13–15	-33.7	-14.9	-15.1	-6.2
Wood products	16	-31.3	-12.2	-15.9	-5.1
Fabricated metals	25	-25.9	-15.7	-10.9	-8.7
Other manufacturing	31–33	-30.7	-9.0	-11.7	-5.1
Other transport equipment	30	-23.3	-11.3	-9.1	-8.1
Motor vehicles	29	-27.8	-5.8	-9.2	1.2
Paper and printing	17–18	-14.1	-18.0	0.5	-11.2
Other non-metallic minerals	23	-23.8	-5.4	-4.6	0.4
Electrical equipment	27	-20.0	-7.9	-12.5	-4.9
Food and beverages	10–12	-14.4	-10.6	-5.4	-7.8
Rubber and plastics	22	-16.7	-5.1	-2.3	-0.6
Basic metals	24	-12.1	-8.7	-2.4	0.4
Machinery and equipment	28	-14.7	-5.2	1.9	0.3
Coke, refined petroleum products	19	-17.1	1.6	-12.0	2.2
Chemicals and pharmaceuticals	20–21	-5.9	-3.6	2.9	-1.3
Electronics	26	-13.9	11.9	-2.9	11.6

Note: This figure shows the simple average across countries of growth in total working hours and employment for any given sector; when using GDP-weighted averages, results are broadly similar and lead to the same conclusions presented in this box. Data are based on a maximum sample of 17 countries; for each sector and quarter, the composition of the countries in the sample varies slightly, with observations based on fewer than 15 Labour Force Survey observations dropped. Red highlights refer to working-hour and employment losses and green refers to working-hour and employment gains. The darker the colour, the greater the losses or gains. Countries and territories considered in the analysis: Austria, Brazil, Costa Rica, Georgia, Greece, Italy, Mexico, North Macedonia, Mongolia, Occupied Palestinian Territory, Peru, Portugal, Slovakia, Thailand, United Kingdom, United States and Viet Nam.

Source: ILO Harmonized Microdata, www.ilo.org/ilostat.

► Gradual, unequal progress in vaccinations: How many jobs remain at risk and for how long?

Equitable access to vaccines is key for sustainable recovery

Unpredictable outbreaks and rebounds of the pandemic, often with unsynchronized economic impacts across countries, now characterize the pandemic. For example, Chinese consumer demand collapsed during the first months of the pandemic but remained largely unaffected in other parts of the world. Yet, when Chinese consumer demand started to recover, the rest of the world went into lockdown. The continued lack of predictability of the crisis creates severe challenges for enterprises. Resolution of such an erratic situation requires that the risk of renewed large-scale pandemic waves be tamed globally. According to the World Health Organization (WHO), “Global equitable access to a vaccine, particularly protecting health care workers and those most at risk, is the only way to mitigate the public health and economic impacts of the pandemic.”⁹

Vaccination progress vastly differs around the world. Some countries remain unable to procure large numbers of vaccines and thus unable to vaccinate large shares of their population. Others have made relatively rapid progress. Some countries have initiated a vaccination programme, owing to the COVID-19 Vaccines Global Access (COVAX) initiative,¹⁰ which has purchased nearly 2.4 billion vaccine doses so far (figure 11a).¹¹

As of 8 June 2021, 11.9 billion doses had been purchased through bilateral agreements between governments or initiatives and vaccine manufacturers. Another 6 billion doses are reserved as optional expansions of the existing agreements or are under negotiation (Duke University 2021). Of the 11.9 billion doses, high-income countries have procured a supply of vaccines sufficient to immunize

their entire populations more than twice (figure 11b). In contrast, upper-middle-income countries have procured a supply for 37 per cent of their populations, while lower-middle- and low-income countries have only enough for 18 per cent of their populations. This inequality in vaccine coverage has led the WHO to call for “immediate donations” to the global COVAX initiative and to launch a call to action to support COVAX, jointly with its partner organizations.^{12,13} Indeed, the economic costs of manufacturing and distributing vaccines globally were found to be considerably lower than leaving some countries without vaccine (Çakmaklı et al. 2021).

Vaccinations save lives, and they contribute to saving enterprises and jobs. Some workers, such as seafarers and aircrew, are essential for the global economy. Vaccinating them will not only safeguard their health but also have an impact on the smooth functioning of global supply chains, including those that are linked to manufacturing production (see box 2).

Vaccinations also have an impact on consumer demand and jobs that are linked through global supply chains. While job losses, increased precariousness and poverty might still hamper consumption growth for quite some time in many countries, recent evidence points to higher consumer confidence among those people in a population that are vaccinated or plan on being vaccinated (Leer 2021). Vaccines have been widely recognized as conducive to support consumer demand recovery (Bhan 2020). Vaccination can have a substantial impact on mitigating new outbreaks of the pandemic (Moghadas et al. 2021), which is likely to make the introduction of large-scale lockdown measures, with adverse impacts on consumption, redundant. According to the WHO, vaccine

⁹ See <https://www.who.int/initiatives/act-accelerator/covax>, accessed 27 April 2021.

¹⁰ COVAX is a global initiative co-led by Gavi, the Vaccine Alliance, the Coalition for Epidemic Preparedness Innovations and the WHO to provide all countries and populations throughout the world with access to vaccines.

¹¹ See <https://www.who.int/news/item/18-12-2020-covax-announces-additional-deals-to-access-promising-covid-19-vaccine-candidates-plans-global-rollout-starting-q1-2021>, accessed 27 April 2021.

¹² See <https://www.un.org/press/en/2021/ecosoc7039.doc.htm>, accessed 27 April 2021.

¹³ See <https://www.who.int/news/item/27-05-2021-covax-joint-statement-call-to-action-to-equip-covax-to-deliver-2-billion-doses-in-2021>, accessed 12 June 2021.

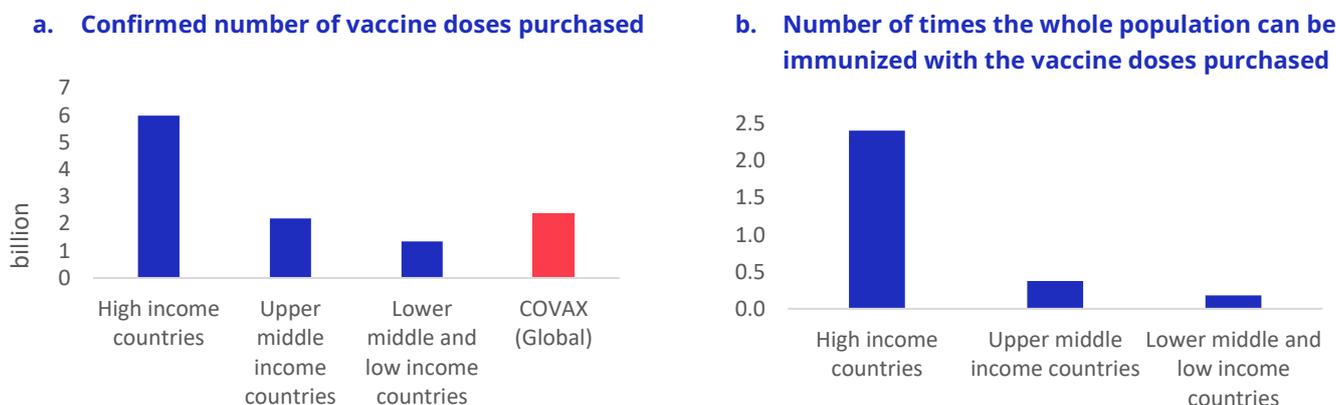
equity is “a matter of controlling the pandemic”.¹⁴ And controlling the pandemic is arguably a requisite for a return of consumer confidence and a stable, broad-based and sustainable recovery of consumer demand and related jobs.

In the following, this brief links current and projected vaccination progress in consumer markets for manufacturing goods to jobs related to their production (see Annex 1 for methodological details). Under the assumption that higher vaccination rates in a country can on average contribute to higher consumer confidence and

a lower probability of unpredictable outbreaks and rebounds, some jobs can be considered to be at a lower risk than others to suffer from adverse impacts of the pandemic on consumer demand.¹⁵

The analysis in this section reveals that vaccinating a country’s population is not necessarily sufficient to stabilize its labour market because millions of jobs depend on consumer demand from other countries. And these countries might not have sufficient access to vaccines to vaccinate their population at large scale any time soon.

► **Figure 11. Confirmed number of vaccine doses procured, by country income status**



Note: Data as of 8 June 2021. For the calculation in panel b, it is assumed that two doses of vaccine are necessary for immunization and that vaccines are given to all age groups of the population. The calculation in panel b does not include vaccines purchased by the COVAX facility because not all of vaccines have been allocated to beneficiary countries.

Source: ILO calculations based on [Launch and Scale Speedometer](#), Duke Global Health Innovation Center, Duke University; UN Population Division.

Box 2

Keeping supply chains moving: Seafarers, aircrew and vaccinations

Global supply chains linked to the manufacturing of goods heavily depend on maritime and air transport. These sectors rely on seafarers and aircrew. They are essential workers required to travel across borders. Such travel – contrary to World Health Organization recommendations – now requires them present proof of a COVID-19 vaccination as a condition for entry into some countries. Those already working at sea or on aircraft are finding it challenging to receive vaccinations due to the distribution of vaccines at the national level of their home country. These workers are far from home, often for many months or even more than one year.

The UN Crisis Management Team for COVID-19, under leadership of the World Health Organization, recognizes that all countries should consider seafarers and aircrew as a priority group for vaccination against COVID-19. On 26 March 2021, the heads of five United Nations organizations called for maritime and air transport workers to be prioritized (together with other key workers) for COVID-19 vaccination due to their key role in supporting global trade and mobility, which are both essential for sustainable socio-economic recovery (ILO 2021d; IMO 2021).

¹⁴ See <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-meeting-of-strategic-advisory-group-of-experts-sage--22-march-2021>, accessed 11 June 2021.

¹⁵ Data used for this brief shows a statistically significant positive correlation between vaccination rates and retail sales, in line with this assumption.

Slow vaccination progress leaves jobs worldwide at greater risk

In the 64 countries that are covered in this brief, more than 280 million jobs are estimated to depend on manufacturing demand from consumers in countries with slower vaccination progress than elsewhere (less than 400 vaccine doses administered per 1000 people by 6 June 2021).¹⁶ This corresponds to nearly half of all jobs in global supply chains for manufacturing in the 64 countries (figure 12). These jobs are located in all regions of the world, including in those countries that have made faster vaccination progress. These jobs are likely to be at a greater risk than others to endure negative pandemic-related impact due to a drop in consumer demand.

As many as 220 million jobs in global supply chains for manufacturing (36 per cent) depend on consumer demand from countries with slow to medium vaccination progress (400-600 doses per 1000 people). A further 37 million jobs (6 per cent) can be linked to consumer demand from countries with medium to fast progress (600-800 doses administered per 1000 people).

An estimated 77 million jobs in global supply chains for manufacturing (12 per cent) rely on consumer demand from countries with the fastest vaccination progress (more than 800 doses administered per 1000 people). Even though rebounds of the pandemic also cannot be excluded in these countries, the hope is that these might be less likely or less severe, with lower adverse impacts on consumer demand and related jobs.

Millions of jobs in global supply chains remain at risk until global vaccination is complete

Recent projections for vaccination progress from the Economist Intelligence Unit (2021) classify countries into four categories relative to when approximately they likely will have a share of 60-70 per cent of their adult population vaccinated. While subject to high levels of uncertainty, these projections take into account “supply deals, production constraints, vaccine hesitancy, the size

of the population, and the availability of health care workers”.

Estimates based on these projections and developed for this brief suggest that nearly 60 million jobs (10 per cent of all jobs in global supply chains for manufacturing) in the 64 countries covered in this brief, are sustained by consumer demand in countries which will not have 60-70 per cent of their adult population vaccinated any time before 2023. Under the assumption that such a level of vaccination coverage would be needed to control the pandemic, these jobs remain vulnerable at least until then to suffer from low or erratic consumer demand. This includes jobs in countries that are making rapid progress with their vaccination programmes.

Around 329 million jobs in global supply chains for manufacturing (53 per cent) are dependent on consumer demand coming from countries whose adult population is projected to achieve 60-70 per cent vaccination coverage by late 2022 only. And 92 million jobs (15 per cent) are projected to remain at risk until mid-2022. An estimated 135 million jobs (22 per cent) likely will be safe at the end of 2021, assuming that the projections for vaccination progress are accurate and that a vaccine coverage of 60-70 per cent of the adult population is sufficient to ensure a full and sustainable recovery of consumption (figure 13).

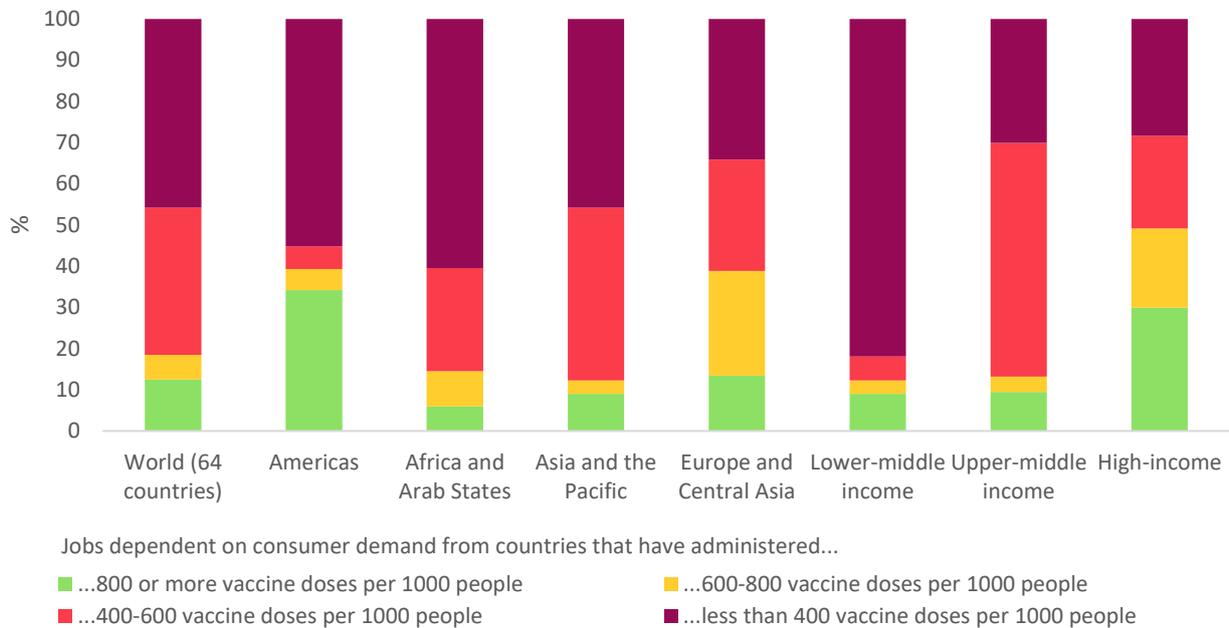
Donations to COVAX save lives and help to sustain jobs

The COVAX initiative supports countries without sufficient access to vaccines through the COVAX Advance Market Commitment (AMC), a financial mechanism that makes large numbers of doses available to these countries. Among the 92 low- and middle-income countries that are eligible to get access to COVID-19 vaccines through the AMC, only 7 countries are among the 64 countries covered in this brief.¹⁷ In the 64 countries, there are overall an estimated 144 million jobs in global supply chains for manufacturing, which depend on consumer demand from these 7 countries. Providing these and other countries with access to vaccines does not only save lives but also helps to sustain these jobs.

¹⁶ Provided that vaccines are used that require two doses for maximum immunization, a rate of less than 400 vaccine doses administered per 1000 people implies that less than 20 per cent of the population has maximum protection from COVID-19.

¹⁷ These countries are Cambodia, India, Indonesia, Morocco, Philippines, Tunisia and Viet Nam. For the full list of AMC-eligible countries, see https://www.gavi.org/sites/default/files/covid/pr/COVAX_CA_COIP_List_COVAX_PR_12-05-21.pdf, accessed 12 June 2021.

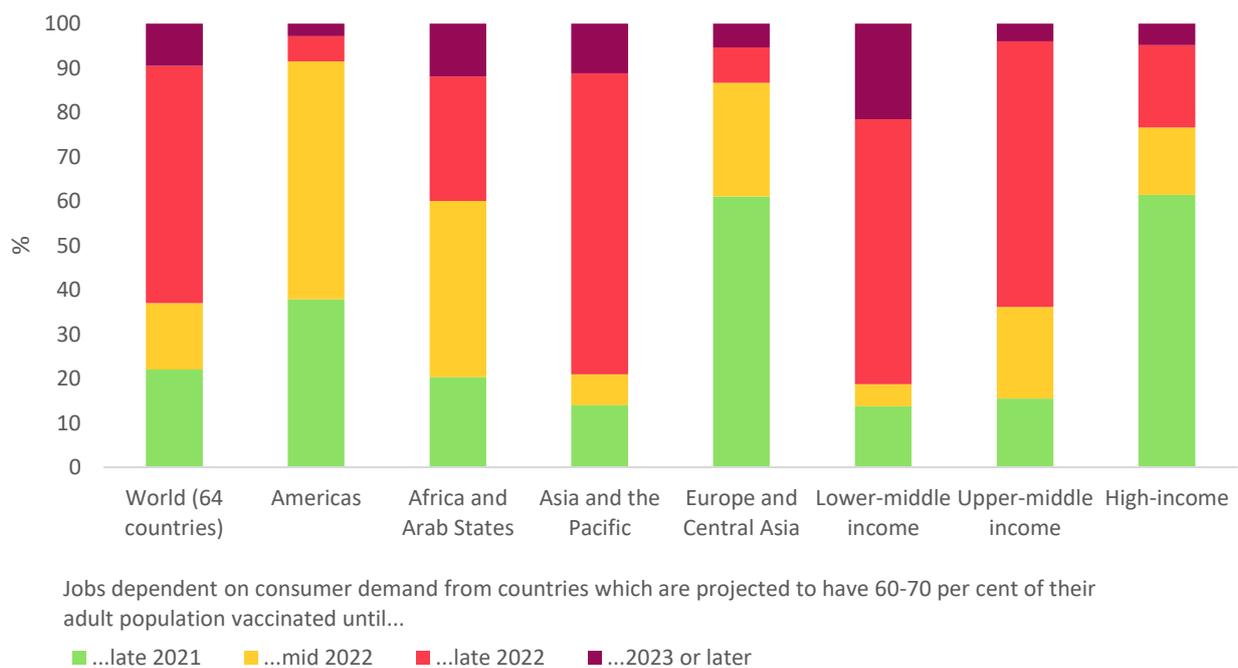
► **Figure 12. Jobs in global supply chains for manufacturing and current vaccination progress in linked consumer markets, by geographical region and by income status (percentage)**



Notes: Vaccination progress as of 6 June 2021. Data from <http://ourworldindata.org/covid-vaccinations>, accessed 6 June 2021.

Source: ILO estimates. See Annex 1 for more details.

► **Figure 13. Jobs in global supply chains for manufacturing and projected vaccination progress in linked consumer markets, by geographical region and by income status (percentage)**



Source: ILO estimates. See Annex 1 for more details.

► The way forward

In many countries, consumer demand for manufacturing products continues to be below the pre-crisis trend, with adverse impacts on millions of jobs worldwide and effects that propagate across borders through global supply chains. Some workers continue to suffer from job losses, working-hour losses or labour-income losses. The roll-out of vaccine programmes brings hope to the horizon. But not all countries have equal access to vaccines or are equally advanced in vaccinating their populations. Leaving some countries and populations without sufficient vaccines for long periods puts at risk millions of jobs that are dependent on consumer demand from these countries.

The seventh edition of the *ILO Monitor: COVID-19 and the World of Work* (ILO 2021a) and the *World Employment and Social Outlook Trends 2021* report (ILO 2021b) offer policy recommendations to mitigate the adverse impacts of the pandemic crisis on enterprises and workers. These recommendations are relevant in the context of the analysis presented in this brief.

An accommodative macroeconomic policy remains key to continuously provide fiscal stimulus to economies. It can help increase consumer confidence and contribute to a sustained and sustainable recovery of consumer demand. Financial support, also given to workers and businesses that form part of global supply chains, remains important to save livelihoods and support workers and their families who are most vulnerable. Unfortunately, not all countries are equally able to provide this stimulus to a sufficient extent.

International solidarity in rolling out vaccines will contribute to saving lives while positively impacting labour markets. Support for low- and middle-income countries is especially crucial. Even if one country has a substantial share of its own population vaccinated, its labour market might still experience adverse impacts through the channeling mechanism of global supply chains if other countries are not making sufficient progress with vaccinations and are hit by new waves of the pandemic.

As shown in this brief, the largest share of workers experiencing high adverse impact from the decline of global consumer demand for manufacturing goods are in lower-middle income countries. Financial and policy support for these countries to mitigate the adverse economic and social impacts is therefore important

because they often do not have the fiscal space or tax base to support their economies with significant fiscal stimulus.

Although global supply chains linked to the demand for manufacturing products have been hit hard, there is heterogeneity in the impact, with a surge in demand for some products from some sectors and a decrease or even collapse in demand for many others. Many of these shifts in global consumption patterns might only be temporary, but some likely will be permanent.

There is a growing consensus that some pre-COVID consumption patterns were unsustainable. Building back better should take the opportunity to encourage consumers to purchase more sustainable products that have a smaller carbon footprint – which is an important element of the transition to a green economy (Liang, Licata and Kapya 2019). Such a transition will create new jobs in some countries and sectors but might have adverse impacts on jobs elsewhere. Support for enterprises and workers during this transition will be essential going forward.

With the experience of the current crisis, many enterprises are striving to increase resilience in their supply chains to be better prepared for major crises that the future might bring. The COVID-19 pandemic has hit different consumer markets at different times, showing that the reliance on only one or a few markets is risky. One important aspect in this context of increased resilience is diversification. Digitalization and automation as well as the reshoring of production can help enterprises increase their supply chain resilience. Once again, support for enterprises and workers is needed to make the necessary transitions, along with policies to minimize or mitigate any adverse impacts.

The ILO Centenary Declaration for the Future of Work, adopted in June 2019, calls for an integrated policy approach with “trade, industrial and sectoral policies that promote decent work and enhance productivity”. The inclusion of labour provisions in trade agreements is one option for governments seeking to pursue such an integrated approach (ILO 2021c). Sustainable industrial policies, if formulated with the full involvement of employers and workers, can be an important tool to

advance full, productive and freely chosen employment and decent work in global supply chains.

The pandemic has exposed weaknesses in the global production networks. Some enterprises and workers have been more vulnerable to this crisis than others. Against this background, the pandemic has highlighted the urgent need to invest in both the economic and social upgrading

of global supply chains. The Resolution concerning decent work in global supply chains, adopted by governments, employers and workers of ILO Member States at the International Labour Conference in 2016, provides important guidance. Resilient, inclusive and sustainable supply chains are necessary to build back better and constitute an integral part of a human-centred future of work.

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► Annex 1: Methodology

This brief estimates to what extent global supply chains propagate adverse demand shocks on jobs in global supply chains linked to the production of manufacturing goods across borders.

The estimates are based on data for 64 countries covered by the latest intercountry input-output (ICIO) tables, Rev. 4 from the Organisation for Economic Co-operation (OECD), published in December 2018. These countries are the 37 OECD member States plus Argentina, Brazil, Brunei Darussalam, Bulgaria, Cambodia, China, Costa Rica, Croatia, Cyprus, India, Indonesia, Hong Kong (China), Kazakhstan, Malaysia, Malta, Morocco, Peru, Philippines, Romania, Russian Federation, Saudi Arabia, Singapore, South Africa, Taiwan (China), Thailand, Tunisia and Viet Nam.

The 64 countries represent 74 per cent of the global labour force. In the Americas, Asia and the Pacific and Europe and Central Asia, the share of the labour force that is covered reaches values of 85 per cent or more. However, for Africa and Arab States, the share that is covered accounts for less than 10 per cent of the total labour force because estimates can only be produced for four countries (table A1).

► **Table A1. Labour force covered by estimates**

	World	Africa and Arab States	Americas	Asia and the Pacific	Europe and Central Asia
Share in total labour force covered (per cent)	74.4	9.8	85.7	86.9	85.1
Labour force covered (millions)	2 591	54	429	1 729	379

The OECD's ICIO tables serve as a basis for the input-output model that links inputs to final demand (see for instance Timmer et al. 2014). This method allows for an assessment of the share in a sector's gross output that is linked to final demand in any country or sector. The ICIO tables are combined with the ILO estimates of employment by detailed sector to translate gross output embedded in manufacturing supply chains into employment.

The combination of data from the ICIO tables with data and estimates of sectoral employment allows for an identification of the overall number of jobs in a certain country and sector that relate to producing certain manufacturing products (garments, motor vehicles, etc.) demanded by consumers in the same or another country. This brief refers to these jobs as jobs in global supply chains that are linked to consumer demand for manufacturing products.

Jobs in global supply chains for manufacturing that experience a high, medium, low or no adverse impact

Step 1: Preparing data and estimates of retail sales growth

To assess the impact of the COVID-19 crisis on consumer demand for manufacturing goods, this brief used country-level data on year-on-year retail sales growth between January 2020 and April 2021, available from Trading Economics on a monthly basis. For each country, the data were used to assess the difference of retail sales in 2020–21 relative to the pre-crisis growth path. The pre-crisis growth path was calculated on the basis of retail sales growth rates observed in 2017–19, before the pandemic.

In order to match these data to the international input-output tables, information is needed for the 64 countries (listed above) as well as for the "rest of the world". These are the different consumer demand destinations that are separated out in the international input-output data. For the 64 countries, out of a total of 1024 observations, only data for 197 observations are missing. This includes 21 missing data points for countries that have some data on retail sales growth, but for which some of the most recent data points are missing. Moreover, this includes 176 missing data points for 11

countries that did not have any data on retail sales growth. The missing data were estimated, using the following procedures.

For countries for which only most recent data points were missing, country-specific ordinary least squares regressions were run on monthly data, regressing the monthly change in retail sales growth on the monthly change in the index of the stringency of lockdown measures from the Oxford COVID-19 Government Response Tracker database. For all countries, without a single exception, the estimated coefficient of these regressions was negative: Tightening lockdown restrictions associated with a deterioration in monthly retail sales growth. This country-specific relationship was used to fill the data gaps for the most recent data points.

For countries with no data on retail sales growth at all, missing data points were estimated on the basis of an ordinary least squares panel regression, regressing retail sales growth on the index of the stringency of lockdown measures, the logarithm of GDP per capita and the interaction between the stringency index and the logarithm of GDP per capita. The coefficients estimated in this regression were then used to estimate retail sales growth for the 11 countries between January 2020 and April 2021.

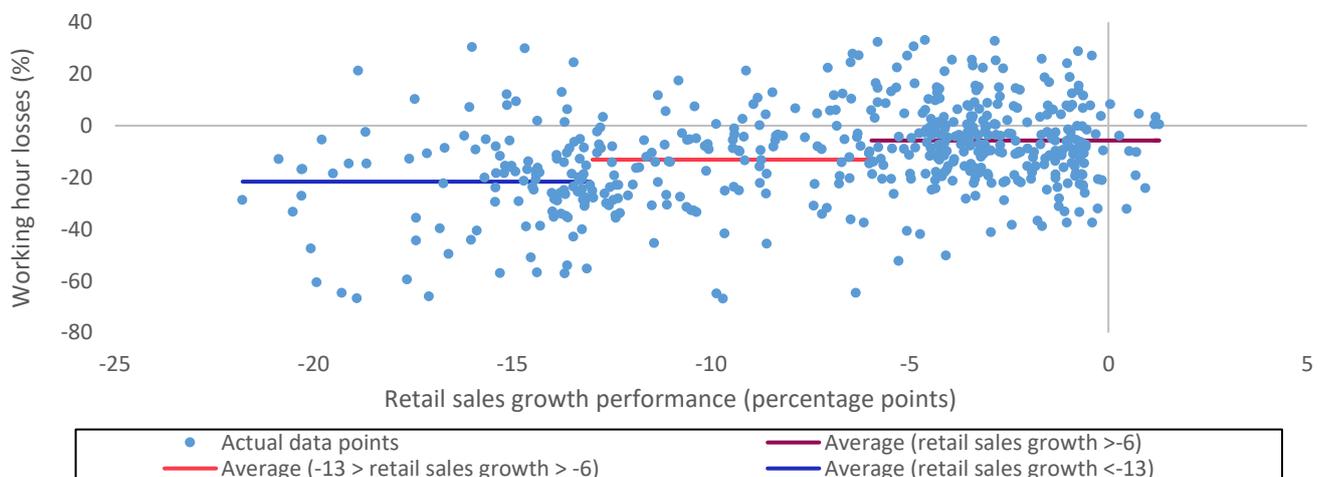
Finally, the data point on retail sales growth for the “rest of the world” was generated on the basis of the simple average of retail sales growth for 109 countries, which excludes the 64 countries that are part of the world and which are countries for which either actual data on retail sales growth are available or for which estimates can be produced, using the procedure outlined above.

Step 2: Identifying thresholds for retail sales growth to classify countries

Each sector within a country has some consumer markets to which its production is linked more than to others. If these consumer markets experience particular large declines in retail sales growth, this sector and country, and the jobs therein, can be expected to see more adverse impacts.

To look at this, a weighted retail sales growth rate was calculated to take into account the retail sales growth in the respective final consumer markets, which the production of a particular sector in a country contributes to. This weighted retail sales growth rate in the final consumer market of a certain country and sector was then linked to working hours in the same country and sector. The assumption was that it is predominantly workers in that particular sector that are impacted if consumer demand for products from this sector falls in the final consumer market.

► **Figure A1. Year-on-year changes in working hours (quarterly, percentage) and retail sales performance across linked consumer markets (quarterly, percentage points)**



Note: Dots show data at the country-sector level for different manufacturing sectors in 14 countries for which data are available. Each dot shows the working hour loss in a sector and country and the weighted retail sales growth performance in the consumer markets that it produces for. The retail sales growth performance is measured as the difference between actual retail sales growth between 2019 and 2020-21, and hypothetical retail sales growth between 2019 and 2020-21 in line with pre-crisis growth patterns.

Source: ILO calculations based on Trading Economics and national Labour Force Surveys.

There is a statistically significant correlation between country-sector specific working-hour losses and average retail sales growth in the respective consumer markets that the production of this particular country and sector contributes to. The harsher the decline in retail sales growth in the consumer markets that a sector within a country is selling to, the greater the working-hour losses in this sector (figure A1).

Two break points in retail sales growth were identified that maximize the difference in working-hour losses: -6 and -13. For retail sales growth (difference from 2017–19) of -6 percentage points or more, average working-hour losses stood at -5.7 per cent. For retail sales growth (difference from 2017–19) of between -6 and -13 percentage points, average working-hour losses stood at 13.1 per cent. For retail sales growth (difference from 2017–19) of less than -13 percentage points, average working losses reached 21.6 per cent.

These thresholds identified consumer markets that experienced a high, medium or low adverse impact. Consumer markets with zero or positive retail sales growth, relative to 2017–19, were considered not to have been adversely impacted.

Step 3: Developing a classification of sectors

The final step was to classify how consumer demand for different products from the manufacturing sector was impacted in different types of countries. This was done on the basis of the observed year-on-year working-hour losses for different manufacturing sectors in 19 countries with available quarterly data, in 2020 Q1–Q4. For each country and quarter, a ranking of manufacturing subsectors according to the observed working-hour losses was generated. Rank 1 would be occupied by the subsector with the best performance in working-hour growth, while the last rank would be occupied by the sector with the worst performance. Then a simple average was taken across all country, quarter and specific rankings, including 2020 Q1–Q4. This ranking was then used to develop the final impact classification.

Table A2. Manufacturing sectors and their average ranking in terms of working-hour losses

Manufacturing sector	ISIC Rev. 4 division	Average rank of subsector in terms of working-hour losses among all manufacturing subsectors	Year-on-year growth in working hours, average (percentage)
Wood products	16	9.1	-17.9
Electrical equipment	27	9.1	-10.8
Motor vehicles	29	8.8	-11.4
Coke, refined petroleum products	19	8.8	-14.5
Garments	13–15	8.8	-19.9
Other transport equipment	30	8.6	-12.9
Other non-metallic minerals	23	8.2	-9.5
Other manufacturing	31–33	7.7	-14.1
Fabricated metals	25	7.6	-15.8
Machinery and equipment	28	7.6	-7.4
Rubber and plastics	22	7.3	-8.7
Paper and printing	17–18	7.1	-6.9
Basic metals	24	6.8	-4.4
Electronics	26	6.0	-0.5
Food and beverages	10–12	5.8	-7.4
Chemicals and pharmaceuticals	20–21	4.6	9.5

Note: The 16 sectors correspond to the manufacturing sectors defined in the OECD's intercountry input-output tables. See table 1 note for more information.

Source: ILO calculations based on national Labour Force Surveys.

Final classification of countries and sectors of final consumer demand, according to their impact

Table A3 shows the overall impact assessment, which combines the impact classification of countries from step 2 with the impact classification of sectors from step 3. The number of jobs linked to final demand of manufacturing goods was then estimated separately for demand that had seen a high, medium, low or no adverse impact.

Table A3. Impact assessment for different manufacturing supply chains

Supply chain	ISIC Rev. 4 division	Impact by retail sales growth rate			
		Countries with retail sales growth < -13	Countries with -6 > retail sales growth > -13	Countries with 0 > retail sales growth > -6	Countries with retail sales growth > 0
Food and beverages	10–12	Medium impact	Low impact	No impact	No impact
Garments	13–15	High impact	High impact	Low impact	No impact
Wood products	16	High impact	High impact	Low impact	No impact
Paper and printing	17–18	High impact	Medium impact	Low impact	No impact
Coke, refined petroleum products	19	High impact	High impact	Low impact	No impact
Chemicals and pharmaceuticals	20–21	Low impact	Low impact	No impact	No impact
Rubber and plastics	22	High impact	Medium impact	Low impact	No impact
Other non-metallic minerals	23	High impact	High impact	Low impact	No impact
Basic metals	24	High impact	Medium impact	Low impact	No impact
Fabricated metals	25	High impact	High impact	Low impact	No impact
Electronics	26	Medium impact	Low impact	No impact	No impact
Electrical equipment	27	High impact	High impact	Low impact	No impact
Machinery and equipment	28	High impact	Medium impact	Low impact	No impact
Motor vehicles	29	High impact	High impact	Low impact	No impact
Other transport equipment	30	High impact	High impact	Low impact	No impact
Other manufacturing	31–33	High impact	High impact	Low impact	No impact

Note: The table shows the impact on the consumer demand for different manufactured goods in different countries, dependent on the retail sales growth rate (difference to 2017–19 growth rate). The 16 sectors correspond to the manufacturing sectors defined in the OECD's intercountry input output tables.

Jobs in global supply chains for manufacturing and vaccination progress in linked consumer markets

This brief links jobs related to manufacturing demand from consumers in certain countries to current and projected vaccination progress in these countries.

Country-level data on the number of vaccine doses administered per 1000 people in the population as of 6 June 2021 are taken from <http://ourworldindata.org/covid-vaccinations>. Based on these data, countries can be classified into four categories relative to their current vaccination progress. Recent projections for vaccination progress from the Economist Intelligence Unit (2021) classify countries into four categories relative to when they likely will have a share of 60-70 per cent of their adult population vaccinated.

The combination of data from international input-output tables with data and estimates on sectoral employment once more allows for an estimate of the corresponding number of jobs that link to the respective four different categories of current and projected vaccination progress.

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