

The postpandemic economy

# The future of work after COVID-19

Executive summary



# McKinsey Global Institute

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# The future of work after COVID-19

COVID-19 brought massive disruption to the workforce, highlighting the importance of physical proximity in work and spurring changes in business models and consumer behavior, many of which are likely to endure. This research examines the long-term impact of COVID-19 on work across several work arenas and in eight economies with diverse labor markets: China, France, Germany, India, Japan, Spain, the United Kingdom, and the United States. Key findings:

**The physical dimension of work is a new factor shaping the future of the work, brought to the fore by health and safety considerations.**

We group occupations in a novel way based on physical closeness, the frequency of human interactions, and where work is done. This analysis shows that the pandemic's short- and long-term impact is concentrated in four work arenas with high levels of proximity: leisure and travel venues (including restaurants and hotels) employing more than 60 million in the eight countries, on-site customer interaction including retail and hospitality (150 million), computer-based office work (300 million), and production and warehousing (more than 350 million). In less dense work arenas such as outdoor production sites, the pandemic's effects may fade quickly. Other work arenas such as medical care and personal care with high level of physical proximity may also see less change because of the nature of the occupations.

**COVID-19 accelerated three trends that could persist to varying degrees after the pandemic with different implications for work.** First, hybrid remote work could continue: 20 to 25 percent of workers in advanced economies and about 10 percent in emerging economies could work from

home three to five days a week, mainly in the computer-based office work arena. That is four to five times the level before the pandemic and may reduce demand for mass transit, restaurants, and retail in urban centers. Second, the growth in share of e-commerce and the "delivery economy," which was two to five times faster in 2020 than before the pandemic, is likely to continue. This trend is disrupting jobs in travel and leisure and hastening the decline of low-wage jobs in brick-and-mortar stores and restaurants, while increasing jobs in distribution centers and last-mile delivery. Finally, companies have enlisted automation and AI to cope with COVID-19 disruptions and may accelerate adoption in the years ahead, putting more robots in manufacturing plants and warehouses and adding self-service customer kiosks and service robots in customer interaction arenas.

**These trends will likely affect work arenas and countries in varying ways and raise new questions for cities.** The four work arenas most affected by proximity account for about 70 percent of the workforce in the six advanced economies we looked at, whereas they amount to about 60 percent in China and just 40 percent in India, where more than half the workforce is engaged in outdoor work. Among advanced economies, too, there are variations. For example, computer-based office work is most prevalent in the United Kingdom and United States, whereas Germany has the highest indoor production from its large manufacturing base. This results in different potentials for remote work and job displacement. Large cities may feel the impact, as remote work reduces demand for transportation, retail, and food service, and smaller cities that were declining before the pandemic may benefit.

**Workforce transitions may be larger in scale than we estimated before the pandemic, and the share of employment in low-wage job categories may decline.** Depending on how extensively these trends stick, our scenarios suggest that more than 100 million workers in the eight countries may need to switch occupations by 2030, a 12 percent increase from before the virus overall and as much as 25 percent more in advanced economies. Workers without a college degree, women, ethnic minorities, and young people may be most affected. The share of employment in low-wage occupations may decline by 2030 for the first time, even as high-wage occupations in healthcare and the STEM professions continue to expand.

**Businesses and policy makers can accelerate many of the future of work imperatives that were already clear before COVID-19.** Companies have a new opportunity to reimagine how and where work is done, thinking through specific work arenas and occupational activities. Speedy and effective worker redeployment will be needed, for example by recruiting and retraining based on skills and experience rather than academic degrees. Policy makers might consider prioritizing equitable access to digital infrastructure as well as new ways of enabling occupational mobility. As the share of independent workers grows, more innovation may be required to secure benefits for them. The pandemic will eventually fade, but the agility and creativity of policy makers and businesses evident during the crisis will need to continue, to find effective responses to the looming workforce challenges.

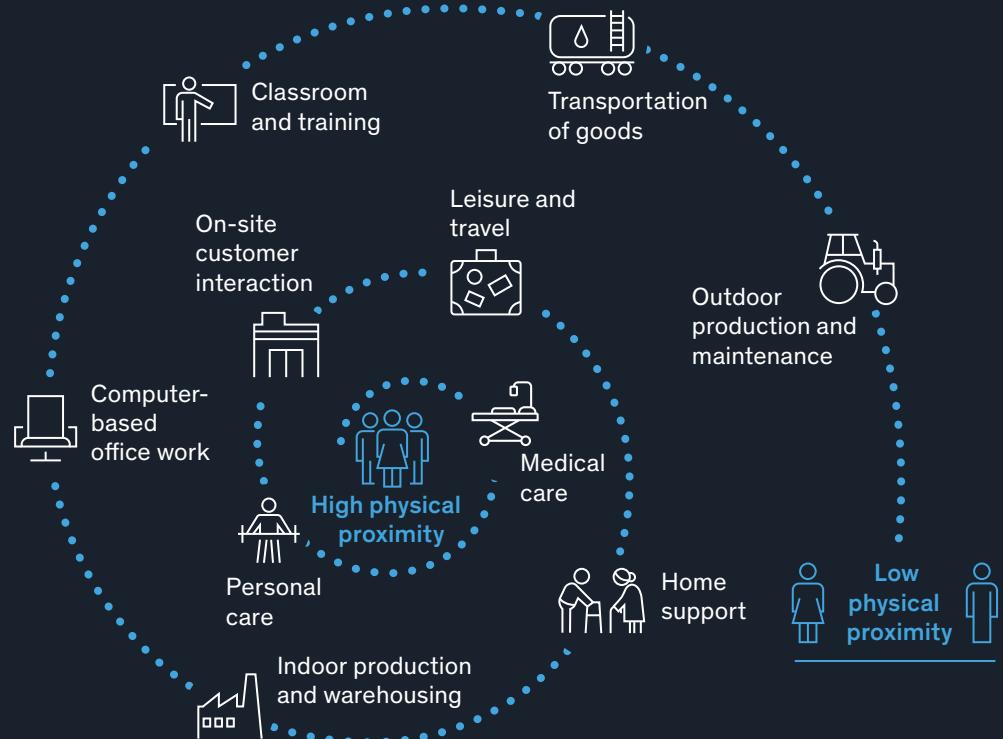
# The future of work after COVID-19

Trends accelerated by COVID-19

Work arenas with high physical proximity were most disrupted short term during COVID-19, and some will see enduring effects.

## Remote work

20–25% of workers in advanced economies could work remotely 3+ days a week on a long-term basis



## Digitization

2–5x growth in e-commerce, as a surge in digital platforms is underway

## Automation

Uptick in use of robotics, robotic process automation, and AI

Occupation transitions may increase by as much as 25 percent by 2030

Increase in occupation transitions between pre- and post-COVID-19 scenarios by 2030, %

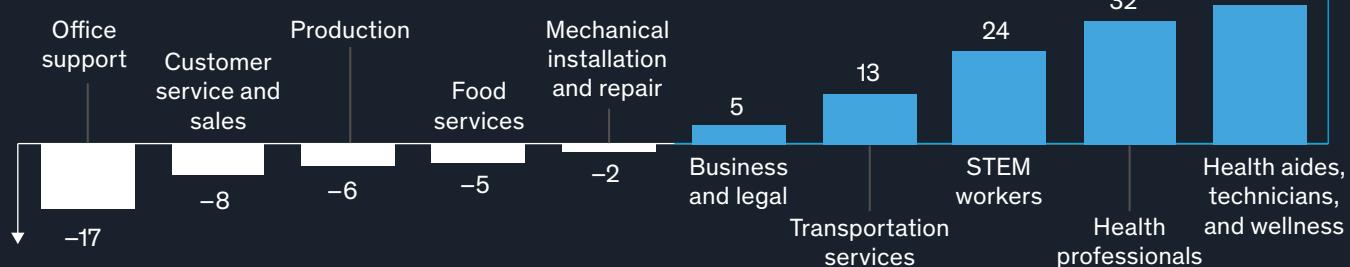


Total workers needing to make occupation transitions in post-COVID-19 scenario, millions



## Labor demand will shift across occupations

Percent change in labor demand in United States, 2018-30, %



Business leaders and policy makers can build out digital infrastructure, enable faster reskilling, and innovate new worker benefits and support mechanisms.



# Executive summary

The impact of COVID-19 on work, the workforce, and the workplace will persist after the health crisis has subsided. This research examines how the trends accelerated by the pandemic may reshape work in the long term.<sup>1</sup> We explore these changes through 2030 in eight countries with diverse economic and labor market models: China, France, Germany, India, Japan, Spain, the United Kingdom, and the United States. Together, these eight countries account for almost half the global population and 62 percent of GDP.

The pandemic has, for the first time, elevated the importance of the physical dimension of work. In this research, we define ten work arenas that group occupations according to their proximity to coworkers and customers, the number of interpersonal interactions involved, and their on-site and indoor nature. We find that jobs in work arenas with higher levels of proximity are likely to see greater transformation after the pandemic, triggering knock-on effects in other work arenas as business models shift in response.

COVID-19 accelerated three groups of consumer and business trends that are likely to persist: remote work and virtual interactions, e-commerce and digital transactions, and deployment of automation and AI. Our research suggests that the disruptions to work sparked by COVID-19 will be larger than we had estimated in our prepandemic research, especially for the lowest-paid, least educated, and most vulnerable workers. We estimate that more than 100 million workers in the eight countries we studied may need to switch occupations, a 12 percent increase compared to before the pandemic overall and a rise of as much as 25 percent in advanced economies. These workers will face even greater gaps in skill requirements. Across countries, we find that job growth may concentrate more in high-wage jobs while middle- and low-wage jobs decline. During the pandemic, policy makers, companies, and workers adapted to new ways of work more quickly than previously thought possible, out of sheer necessity. In the longer term, similarly agile and collaborative responses could lead to higher productivity growth and create career paths with upward mobility for workers. Businesses could respond by reimagining where and how work is done and finding new ways to hire, train, and redeploy workers with a focus on in-demand tasks rather than whole jobs. Policy makers could consider expanding digital infrastructure and enabling more labor market flexibility, for instance by removing barriers to worker mobility, equipping workers facing job transitions, and supporting workers in the gig economy.

## **COVID-19 has highlighted the importance of physical proximity as a factor shaping the future of work**

Before the pandemic, the largest disruptions to work involved new technologies and growing trade links, and a large body of academic research examined their impact on employment and jobs.<sup>2</sup> COVID-19 has elevated the importance of a different aspect of work: its physical nature. Using data from O\*NET OnLine, we quantify for more than 800 occupations five physical attributes: closeness to customers or coworkers, frequency of human interactions required, whether those interactions are with a small set of colleagues or an ever-changing stream of strangers, whether the work is indoors, and whether it requires on-site presence (see Box E1, “Our methodology”).

<sup>1</sup> This report builds on five years of McKinsey Global Institute research on the future of work. See *Jobs lost, jobs gained: What the future of work will mean for jobs, skills, and wages*, November 2017; *The future of work in Europe*, June 2020; *The future of work in America: People and places, today and tomorrow*, July 2019.

<sup>2</sup> See, for instance, David Autor, David Mindell, and Elisabeth Reynolds, *The work of the future: Building better jobs in an age of intelligent machines*, MIT Task Force on the Work of the Future, November 2020; Acemoglu et al., *AI and jobs: Evidence from online vacancies*, National Bureau of Economic Research (NBER) working paper number 28257, December 2020, revised January 2021; Daron Acemoglu and Pascual Restrepo, *Automation and new tasks: How technology displaces and reinstates labor*, NBER working paper number 25684, March 2019.

## Our methodology

This report builds on a large body of MGI research on the future of work.<sup>1</sup> To assess the potential impact of COVID-19 on the workforce in the long term, we offer three novel analyses that dissect occupations and work activities. We acknowledge the significant uncertainties involved in such an exercise but believe our approach is a useful way to frame and assess potential longer-term implications of COVID-19 on the future of work and how they might vary across work arenas and countries. For more details of our methodology, see the technical appendix.

**Occupation clustering into work arenas, reflecting the proximity involved in work.** Using data from O\*NET OnLine and other sources, we quantify five characteristics for each of more than 800 occupations: physical closeness to customers or coworkers, frequency of human interactions required, whether those interactions are with a small set of colleagues or an ever-changing stream of strangers, whether work is indoors, and whether it requires on-site presence. We create a score for each characteristic and average them to create an overall physical proximity score for each occupation. We cluster the 800 occupations into ten work arenas based on commonality across the five metrics, calibrated by an assessment of the roles and work contexts involved in each. Our approach results in a different perspective on work than traditional sector classification, as occupations in sectors may fall into different work arenas.

**Potential for remote work, based on the activities and tasks within occupations.** We examine more than

2,000 work activities defined by O\*NET OnLine. We assess whether an activity can be performed remotely in theory—or when required by a pandemic—and which activities can be performed remotely without a loss of productivity or effectiveness. Teaching, for instance, can theoretically be performed remotely through online classes, but for younger children it is less effective than in-person classes. Based on our estimates of time spent on each activity within 800 occupations from previous MGI research, we can calculate the amount of time that could be spent working remotely for each occupation. Because the data are available only for the United States, we assume that time spent within occupations in other countries is similar.

**Scenarios for net labor demand and workforce transitions, before and after COVID-19.** We model two scenarios for net labor demand for 800 occupations in each country. In the pre-COVID-19 scenario, we use the midpoint automation adoption scenario from MGI's previous research.<sup>2</sup> Results in this report may differ from those previously published because we have updated all data to the most recent available, including a baseline projection for GDP growth through 2030 (from Oxford Economics) and for labor force growth.<sup>3</sup> This scenario includes the impact of midpoint automation adoption on labor displacement and job creation stemming from seven macro drivers of labor demand, such as rising incomes, aging populations that require more healthcare, the shift to renewable energy, and other trends. In the post-COVID-19 scenario, we also include the impact of three broad groups of trends accelerated by the pandemic that may persist in the long term, albeit

at somewhat lower levels than seen during 2020: the shift to remote work for some workers and a consequent reduction in business travel, the growth of e-commerce and online transactions that propels the delivery economy, and a potential long-term acceleration in automation adoption for some uses. Our model does not follow a dynamic equilibrium approach and therefore does not assess changes in wages or interest rates. We chose not to model some trends that could affect work but are less certain, such as a shift in globalization and trade flows.

This work is not meant to provide a forecast of labor demand through 2030. We assess various factors influencing the future level at which COVID-19 trends could settle to construct a plausible set of assumptions for the post-COVID-19 scenario. Our results and the view they provide of the future of work could be overstated for various reasons—for instance, if vaccinations accelerate and herd immunity is quickly achieved, if companies and workers choose to return to the office full-time, if consumers return fully to in-person shopping and dining patterns, and if the momentum around digital technologies and automation fades. Conversely, COVID-19 may disrupt the future of work even more if the virus mutates rapidly and requires continued physical distancing and other precautions for several more years; if fiscal measures are unable to prevent high rates of long-term unemployment, prompting people to leave the labor force; or if the economic recovery takes longer than our current scenario envisions.

<sup>1</sup> See MGI reports at McKinsey.com: *Jobs lost, jobs gained: What the future of work will mean for jobs, skills, and wages*, December 2017; *Skill shift: Automation and the future of the workforce*, May 2018; *The future of work in America: People and places, today and tomorrow*, July 2019; *The future of work in Europe*, June 2020.

<sup>2</sup> See *Jobs lost, jobs gained: What the future of work will mean for jobs, skills, and wages*, McKinsey Global Institute, December 2017, McKinsey.com.

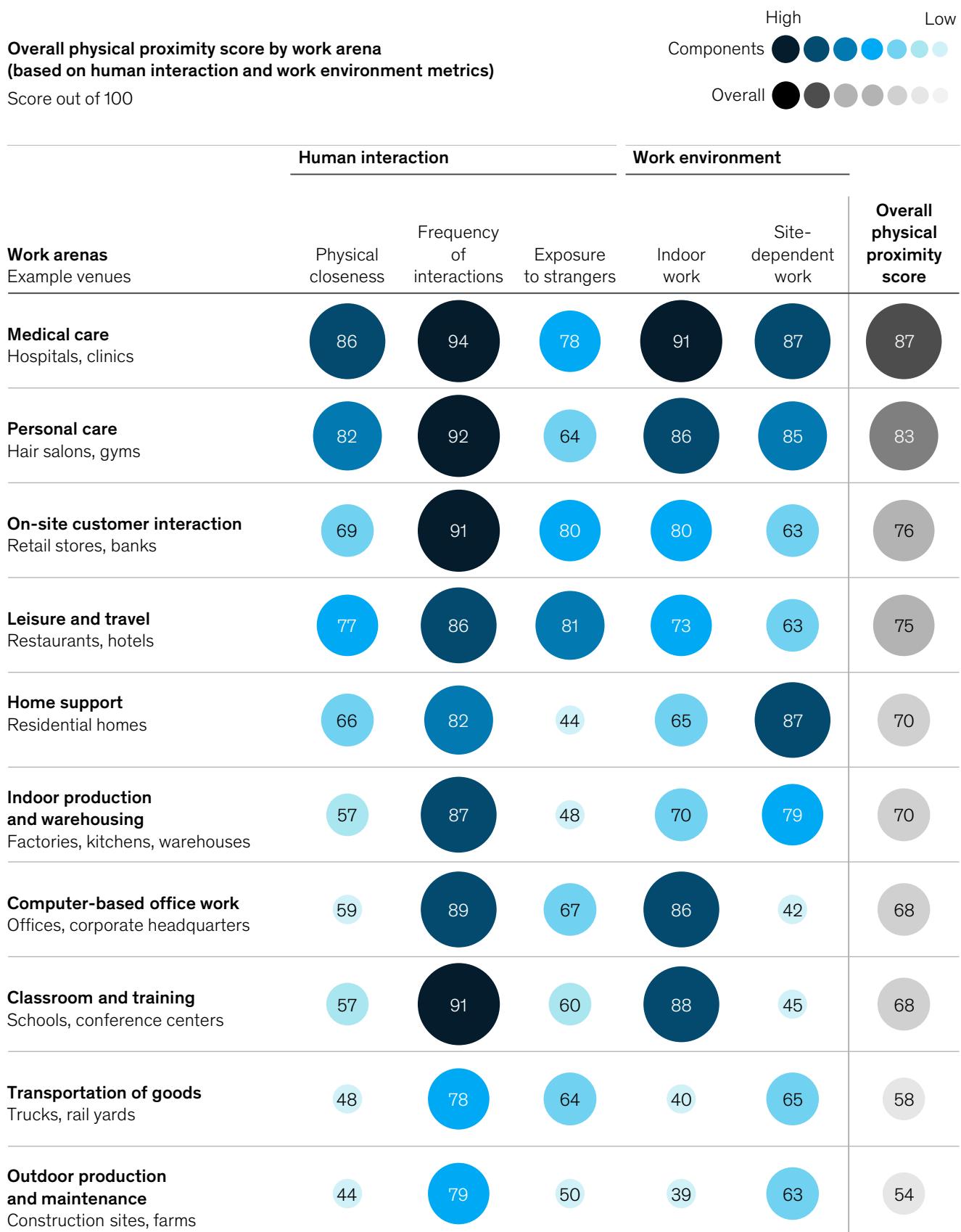
<sup>3</sup> See chapter 4 and the technical appendix for more detail.

We then cluster occupations based on these five metrics into ten work arenas, shown in Exhibit E1. This results in a different view of work than traditional sector classifications. For instance, our medical care arena differs from the healthcare sector in that it includes only caregiving roles that interact closely with patients, such as doctors and nurses, not administrative staff (who fall into the computer-based office work arena), or lab roles (included in the indoor production work arena).

The short- and potential long-term disruptions to these work arenas from COVID-19 vary. During the pandemic, the virus most severely disrupted work arenas with the highest overall physical proximity scores: medical care, personal care, on-site customer service (in retail and hospitality), and leisure and travel, which includes many food service workers, hotel staff, and some airport jobs. Work in the computer-based office arena went almost entirely remote. In the longer term, work arenas with higher physical proximity scores are also likely to be more disrupted, although proximity is not the only explanation. We offer a few illustrations here:

- The on-site customer interaction arena includes frontline workers who interact with customers in retail stores, banks, and post offices, among other places. Work in this arena is defined by frequent interaction with strangers and requires on-site presence. Many venues in this work arena were shuttered during the pandemic. Some work migrated to e-commerce and ordering online, a behavioral change that is likely to stick.
- The leisure and travel arena is home to customer-facing workers in hotels, restaurants, airports, and entertainment venues. Workers in this arena interact daily with crowds of new people. COVID-19 forced most leisure venues to close in 2020 and airports and airlines to operate on a severely limited basis. In the longer term, the shift to remote work and reduction in business travel, as well as automation of some occupations, such as food service roles, may curtail demand for work in this arena.
- The computer-based office work arena includes offices of all sizes, corporate headquarters, and administrative workspaces in hospitals, courts, and factories. Work in this arena requires only moderate physical proximity to others and a moderate number of human interactions. A distinguishing feature of this work arena is that much of the work can be done remotely because it does not involve special equipment or in-person customer interactions. This is the largest work arena in advanced economies, accounting for roughly one-third of employment. Nearly all potential remote work is within this arena.
- The outdoor production and maintenance arena includes construction sites, farms, residential and commercial grounds, and other outdoor spaces. Work here requires low proximity and few interactions with others, and it takes place fully outdoors. Given these characteristics, COVID-19 had a limited impact on work in this work arena. This is the largest arena in China and India, accounting for 35 to 55 percent of their workforces, while in advanced economies less than 15 percent of the workforce is engaged in it.

## Work arenas vary in overall physical proximity.



Note: Occupations grouped into ten work arenas based on overall physical proximity score that combines O\*NET data for human proximity in the workplace, including for physical proximity, face-to-face discussions, and dealing with external customers, with O\*NET data on types of work environments and work environment score (average of O\*NET score for workplaces such as outdoor/indoor and environmentally controlled, and our assessment of site dependence of occupations based on various O\*NET data).

Source: Employment and Training Administration, US Department of Labor; O\*NET OnLine; McKinsey Global Institute analysis

## **COVID-19 has accelerated three broad trends that may reshape work even after the pandemic recedes**

We consider potential enduring workforce effects by analyzing three groups of trends accelerated by COVID-19 that may persist after the pandemic recedes, disrupting how and where work is done. They are the shift to remote work and virtual interactions, the surge in use of e-commerce and other digital platforms, and the deployment of automation and AI. In each case, the pandemic pushed companies and consumers to rapidly adopt new behaviors. We consequently see a sharp discontinuity between the level of adoption before and during the pandemic. The extent to which these trends persist after the pandemic remains to be seen, but there is growing evidence that many of the new behaviors will persist, even if at somewhat lower levels than the peak. Exhibit E2 offers an illustration of the prevalence and usage of these trends before, during, and after the pandemic.<sup>3</sup>

We aim not to be predictive but instead to identify a few key factors for each trend that might alter the trajectory of change and momentum in consumer and business behavior in the years to come. For example, the level at which remote work persists depends on companies' ability to devise work models that balance worker flexibility with the greater effectiveness of in-person work for several key activities. The potential acceleration of automation depends on whether firms continue to invest in those technologies to reconfigure work and capture broader opportunities after the pandemic. A set of assumptions on the possible trajectory for each trend, with country variations, forms the core of our post-COVID-19 scenario modeling.<sup>3</sup>

### **Remote work and virtual meetings are likely to continue, albeit less intensely than at the pandemic's peak, with knock-on effects for real estate, business travel, and urban centers**

Perhaps the most obvious impact of COVID-19 on the labor force is the dramatic increase in employees working remotely. While telecommuting has been possible for many years, remote work during the pandemic was supported by rapid deployment of new digital solutions, such as videoconferencing, document-sharing tools, and expansion of cloud-based computing capacity. Countries quickly designated essential workers who had to be on-site and told everyone else to stay home. That experience proved some of the benefits of remote work, including greater flexibility for workers and more efficiency for businesses. How much will stick is uncertain, but employers and employees who can work from home agree that remote work—at least for part of a workweek—is here to stay.

To determine how extensively remote work might persist after the pandemic, we analyzed its potential in more than 2,000 tasks used in some 800 occupations across the eight focus countries.<sup>4</sup> The pandemic demonstrated that much more work could be done remotely than previously thought, including business sales calls, legal arbitration and trials, doctor visits, classroom learning, real estate tours, and even expert repairs of the world's most sophisticated machinery made with the help of virtual reality headsets.

We also found that some work that technically can be done remotely is best done in person. For instance, schooling went online during the crisis, but parents and teachers alike noted a loss of effectiveness, particularly in the instruction of young children and students with special needs.<sup>5</sup> Negotiations, critical business decisions, brainstorming sessions, providing sensitive feedback, and onboarding new employees are examples of activities that may lose some effectiveness when done remotely.

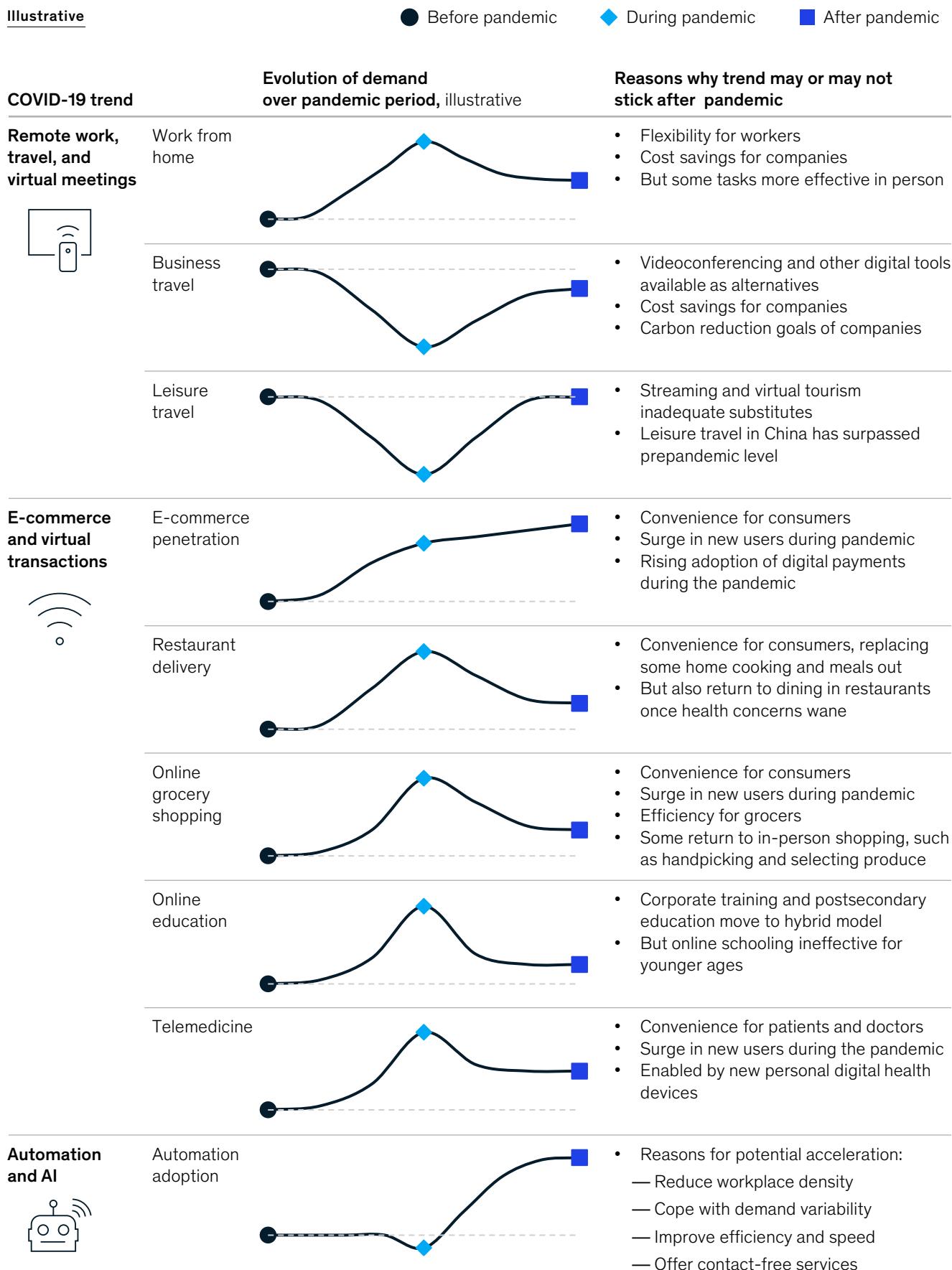
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<sup>3</sup> For more detail, see Box E2, chapter 4, and the technical appendix.

<sup>4</sup> Susan Lund, Anu Madgavkar, James Manyika, and Sven Smit, "What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries," McKinsey Global Institute, November 2020, McKinsey.com.

<sup>5</sup> Valerie Strauss, "Five concerns about the mass rush to online learning that shouldn't be ignored," March 30, 2020, *Washington Post*, washingtonpost.com; Rebecca Branstetter, *How teachers can help students with special needs navigate distance learning*, Greater Good Science Center, UC Berkeley, October 2020, greatergood.berkeley.edu.

**COVID-19 has prompted consumer and business behavior shifts, many of which will persist to varying degrees in the long run.**



Source: McKinsey Global Institute analysis

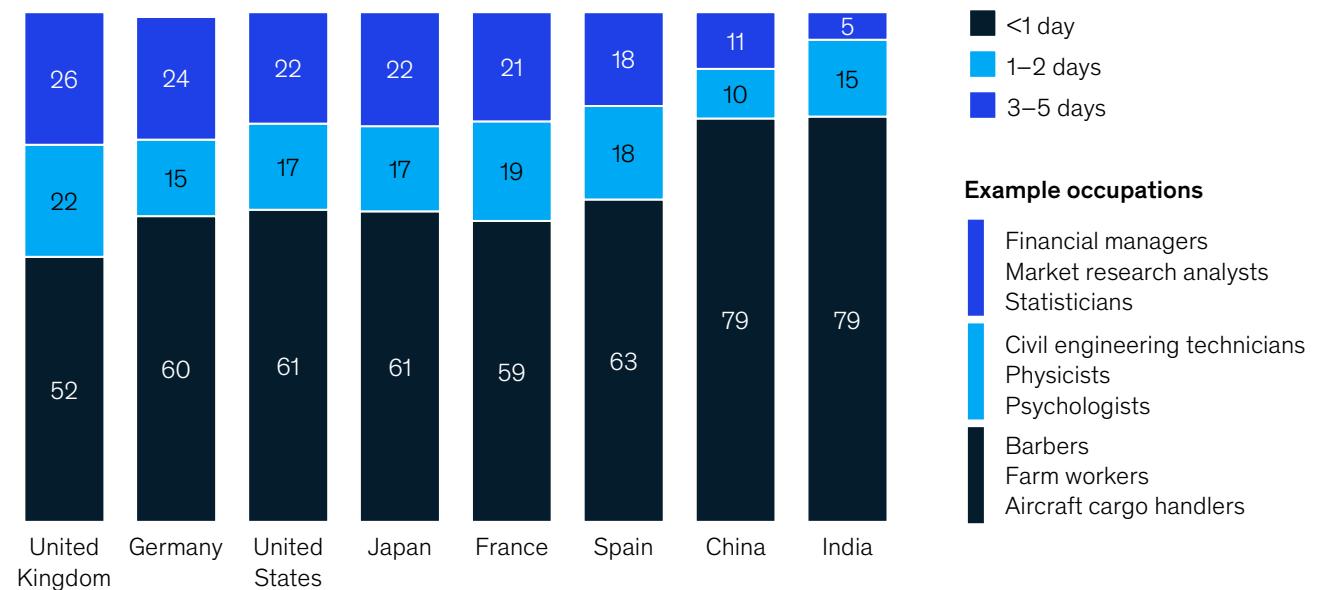
Considering only remote work that can be done without a loss of productivity, we find that about 20 to 25 percent of the workforces in advanced economies could work from home between three and five days a week. Advanced economies, with a greater share of jobs in the computer-based office arena, have a higher potential for remote work than emerging economies (Exhibit E3).

Exhibit E3

**Potential for remote work is higher in advanced economies, yet only 20 to 25 percent of workers could work remotely three to five days a week.**

**Workforce with remote work potential by number of days per week**

% of 2018 workforce



1. Theoretical maximum includes all activities not requiring physical presence on-site; effective potential includes only those activities that can be done remotely without losing effectiveness. Model based on more than 2,000 activities for more than 800 occupations.

Note: Figures may not sum to 100% because of rounding.

Source: McKinsey Global Institute analysis

Although those who can work from home three to five days a week are a minority, they represent four to five times more remote work than occurred before the pandemic, and the ripple effect of so many more employees working from home could have major implications for urban centers.<sup>6</sup> Demand for restaurants and retail in downtown areas and for public transportation may decline. Some companies are planning to shift even faster to flexible workspaces, reducing overall space needed if fewer workers on any given day are in the office. A survey of 278 executives by McKinsey in August 2020 found an average planned reduction in office space of 30 percent.<sup>7</sup> Increased remote work may also prompt a larger change in the geography of work, as individuals and companies shift out of the largest cities to suburbs and smaller cities (see Box E2, “Will COVID-19 change the geography of work?”).

<sup>6</sup> Santo Milasi, Ignacio González-Vázquez, and Enrique Fernández-Macías, *Telework in the EU before and after the COVID-19: Where we were, where we head to*, European Union Science for Policy Briefs, 2020, ec.europa.eu; Drew DeSilver, “Before the coronavirus, telework was an optional benefit, mostly for the affluent few,” Pew Research Center, March 20, 2020, pewresearch.org.

<sup>7</sup> McKinsey Corporate Business Functions Practice, “Reimagine: Preparing for SG&A in the next normal,” November 2020, McKinsey.com.

## Will COVID-19 change the geography of work?

Over the past decade, jobs concentrated in the world's largest cities and people flocked to them, but remote work could dampen or even reverse that migration. Prior to the pandemic, MGI research found that the largest cities in the United States and Europe accounted for a disproportionate share of job growth after the 2008 global financial crisis, while many smaller cities and rural areas fell behind.<sup>1</sup>

Some shifts are under way, although whether they persist after economies reopen remains to be seen. Office vacancy rates increased significantly across major cities in 2020: by 91 percent in San Francisco, 45 percent in Edinburgh, 32 percent in London, and 27 percent in Berlin, for instance. At the same time, office vacancy rates have declined in smaller cities such as Glasgow and Charlotte.<sup>2</sup> Some companies are discussing opening satellite offices in smaller cities, in part to attract talent there. Other smaller cities developed incentive programs to encourage remote workers to relocate.<sup>3</sup>

Residential rents in the United States show a similar pattern, with people moving to suburbs and smaller cities and away from urban centers (Exhibit E4). In Spain, rents decreased in large cities like Madrid, Barcelona, and Seville but rose in smaller cities such as Salamanca and Granada. We analyzed data from LinkedIn that show more of its members moved to smaller cities from larger cities in the United States in 2020 than in 2019. The results show that major metropolitan areas, such as New York City, the San Francisco Bay Area, Washington, DC, and Boston, had the greatest decline in inflow-outflow ratio of members, while smaller cities such as Madison, WI; Jacksonville, FL; and Salt Lake City had the greatest growth,

Whether this migration is permanent remains to be seen.<sup>4</sup> How the geography of work evolves will depend on multiple factors. City governments could tilt the balance with tax incentives for businesses and workers, and future investments in urban infrastructure and spaces could enhance the attractiveness of different locations. After the pandemic, individuals may reweigh their choices about cost of living and neighborhood density versus easy access to major travel, cultural, innovation, and recreational hubs.

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<sup>1</sup> See *The future of work in Europe: Automation, workforce transitions, and the future geography of work*, McKinsey Global Institute, June 2020; *The future of work in America: People and places, today and tomorrow*, McKinsey Global Institute, July 2019, McKinsey.com.

<sup>2</sup> JLL office statistics, Q3 2020.

<sup>3</sup> Tulsa, OK, for instance, offers remote workers who relocate to the city for at least a year \$10,000 and access to coworking spaces. Tulsa Remote, tularemote.org.

<sup>4</sup> "NEF spotlight: A pandemic reboot for cities," January 26, 2021, McKinsey.com.

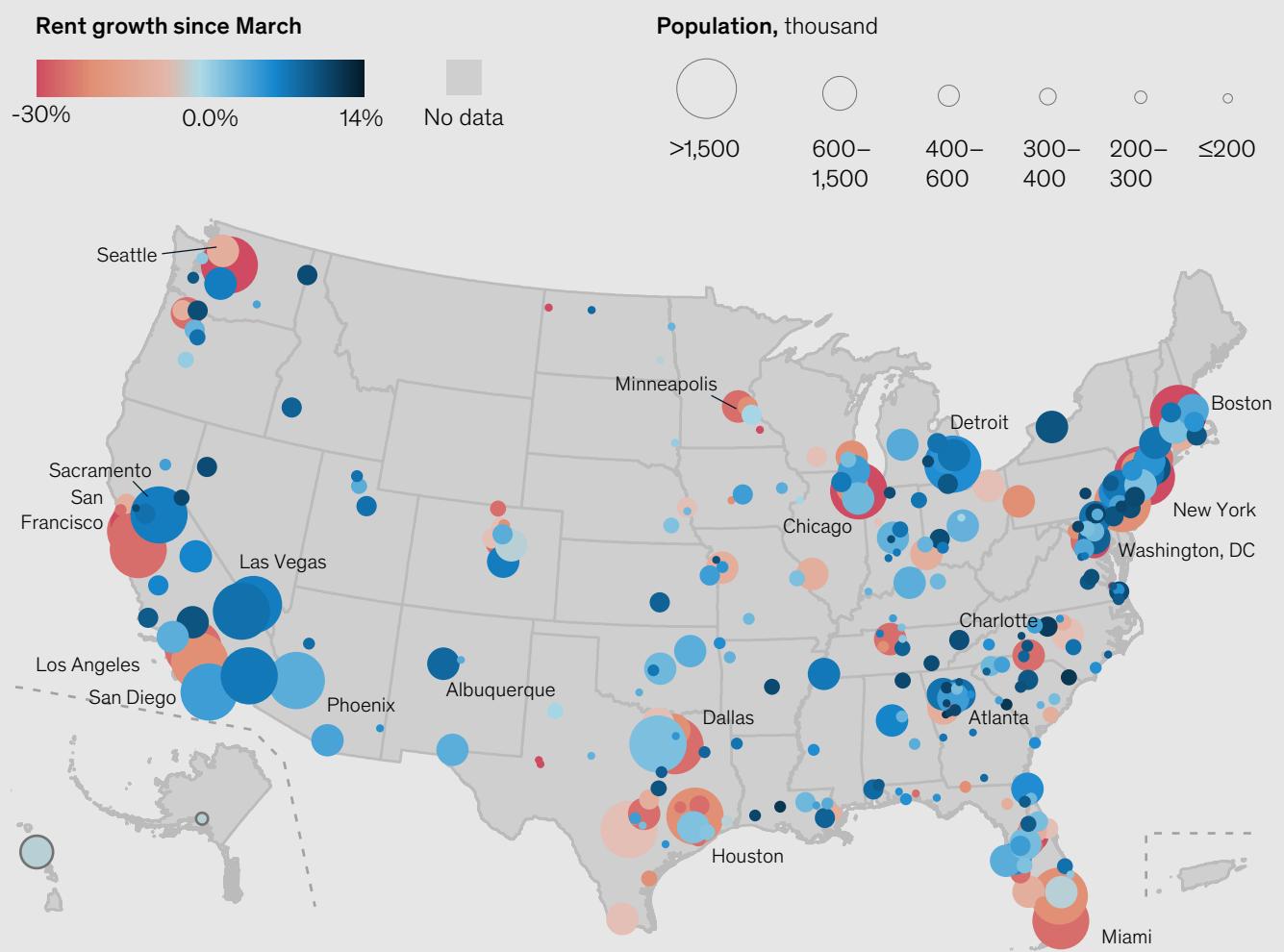
In addition, extensive use of videoconferencing during the pandemic has ushered in a new acceptance of virtual meetings and other aspects of work, which many companies expect to replace some business travel after the pandemic. While leisure travel and tourism will likely rebound when the pandemic ends, as it has in China already, business travel may take a different path. McKinsey's travel practice estimates that about 20 percent of business travel may not return after the pandemic.<sup>8</sup> This would have a significant knock-on effect on employment in commercial aerospace and airports, hospitality, and food service.

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<sup>8</sup> Also see Scott McCartney, "The Covid pandemic could cut business travel by 36 percent—permanently," *Wall Street Journal*, December 1, 2020, wsj.com.

**Residential rents declined in the largest US cities but increased in suburbs and smaller cities.**

**Change in rent by county, March to November 2020**



Source: Apartment List; McKinsey Global Institute analysis

**E-commerce and other virtual transactions are booming, creating increased demand for gig work**

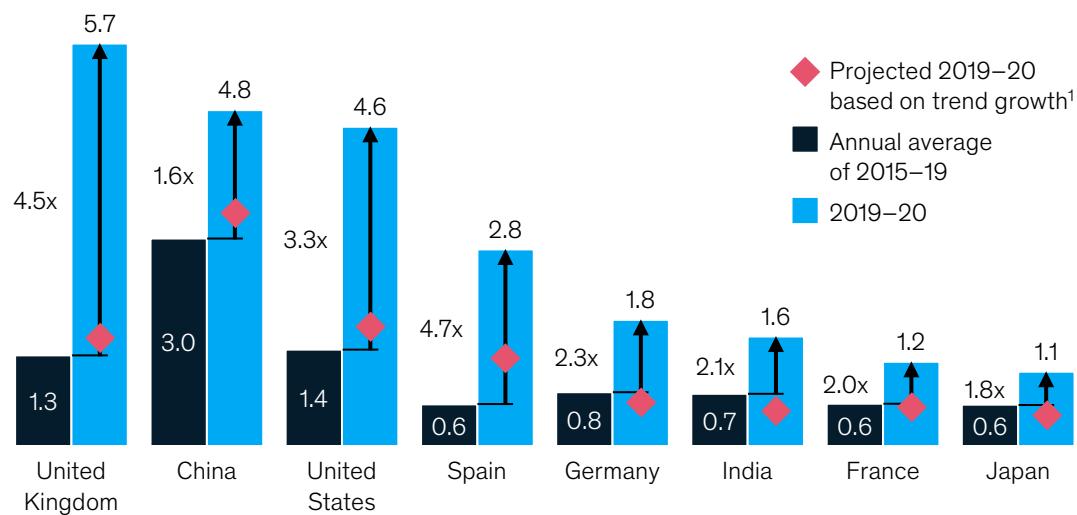
Many consumers discovered the convenience of e-commerce, grocery delivery ordered by app, and other online activities during the pandemic. In 2020, share of e-commerce in retail sales grew at two to five times the rate before COVID-19, increasing its share of total retail sales by several multiples (Exhibit E5). Moreover, three-quarters of people using digital channels for the first time during the pandemic say they will continue using them when things return to “normal,” according to McKinsey Consumer Pulse surveys conducted around the world.<sup>9</sup> Data from countries where the recovery is already under way, such as China, suggests some reversion to brick-and-mortar consumption but continued higher use of digital channels.

<sup>9</sup> See “Global surveys of consumer sentiment during the coronavirus crisis,” October 2020, McKinsey.com.

## E-commerce has grown two to five times faster than before the pandemic in every country.

### Year-over-year growth of e-commerce as share of total retail sales

Percentage points



### 2020 e-commerce sales as percentage of total retail sales

Country	2020 e-commerce sales as percentage of total retail sales
United Kingdom	24
China	27
United States	20
Spain	9
Germany	14
India	7
France	9
Japan	10

1. Based on linear trend of 2015–19 growth; 2017–19 trend used for India and Japan due to break in trend.

Source: Euromonitor International Retailing 2021 Edition; McKinsey Global Institute analysis

Other kinds of virtual transactions such as telemedicine, online banking, and streaming entertainment have also taken off. Online doctor consultations through Practo, a telehealth company in India, grew more than tenfold between April and November 2020.<sup>10</sup> In China, Ping An Good Doctor more than doubled revenue in its online healthcare business in the first half of 2020.<sup>11</sup> Use of telemedicine may decline somewhat as economies reopen but is likely to continue well above levels seen before the pandemic.

This shift to digital transactions has propelled growth in delivery, transportation, and warehouse jobs, while setting off declines among in-store retail jobs such as cashiers. As retail sales online have jumped, retailers are closing brick-and-mortar locations. Macy's and Gap are among the many retailers that have announced plans to close hundreds of stores across the United States. Meanwhile, Amazon hired more than 400,000 workers worldwide during the pandemic.<sup>12</sup> In China, e-commerce, delivery, and social media jobs rose by more than 5.1 million during the first half of 2020.<sup>13</sup>

Many of the jobs created in long-haul transportation and last-mile delivery come via the gig economy and independent contractors. The growth of e-commerce and other digital transactions may therefore imply a shift to gig jobs in the independent workforce.

<sup>10</sup> The Practo Blog, "Building access to quality healthcare: COVID-19 & beyond," November 30, 2020, [blog.practo.com](http://blog.practo.com).

<sup>11</sup> 2020 Interim Report, Ping An Healthcare and Technology Company, August 20, 2020.

<sup>12</sup> Karen Weise, "Pushed by pandemic, Amazon goes on a hiring spree without equal," *New York Times*, November 27, 2020, [nytimes.com](http://nytimes.com).

<sup>13</sup> Renhong Wang and Zirui Chu, "Alibaba provided more than 2 million flexible employment opportunities in the first quarter," *People News*, April 24, 2020; Mengling Chen, "Interview of Didi's CEO Wei Cheng," *CCTV News*, October 26, 2020; "2020 First half Meituan delivery rider employment report," *Meituan Research Institute*, July 20, 2020; "SF Express helped stabilize employment, providing 230,000 jobs in the first half of the year," *Guangdong Provincial Postal Administration*, July 27, 2020.

# 2/3

Proportion of executives expecting to increase investment in automation and AI

Independent work provides the flexibility that many workers with other commitments require, and during the pandemic it was a safety net for individuals furloughed from other jobs.<sup>14</sup> But independent work—particularly jobs on gig platforms—offers no clear career pathway for workers to follow to increase their skills and income. Independent workers in some countries also lack paid sick leave or other benefits. Policy makers extended some benefits to self-employed and gig workers for the first time during the pandemic, but more work will be required to make these programs permanent.

## **COVID-19 may propel faster adoption of automation and AI, especially in work arenas with high physical proximity**

Experience has shown that in periods of recession, the share of jobs with mainly routine tasks declines as businesses seek to control their cost base while dealing with margin pressure and to mitigate uncertainty by improving efficiency. Two ways they have done this are adopting automation technologies and redesigning work processes.<sup>15</sup> When we look at the aftermath of the 2008 financial crisis, for example, we find a lasting decline in routine jobs across the United States and several European Union countries.

Although many companies have held back from increased spending during the pandemic, evidence is emerging that investment in automation may pick up during the recovery. In our global survey of 800 senior executives in July 2020, two-thirds said they were stepping up investment in automation and AI either somewhat or significantly.<sup>16</sup> Reflecting this, the share prices of global industrial robotics and AI companies rose much faster than the overall market in 2020. And while production figures for robotics in China dipped in early 2020, they exceeded prepandemic levels by June 2020.<sup>17</sup>

Our research suggests that faster adoption of automation, AI, and digital technologies is likely to be concentrated in specific use cases, reflecting company priorities related to COVID-19. One example seen anecdotally during the pandemic was deployment of technologies to cope with surges in demand. This included automation in warehouses and logistics that enabled companies to cope with higher volumes of e-commerce, or in manufacturing plants to ramp up production of items that saw demand spikes, such as food and beverage, consumer electronics, and masks and other personal protective equipment. Secondly, many companies used technology to reduce workplace density. For instance, meatpacking and poultry plants, which fall into the indoor production and warehousing arena, accelerated deployment of robotics.<sup>18</sup> Service robots have also been enlisted to deliver supplies in hospitals and room service orders in hotels. Companies deployed more self-checkout in grocery stores and pharmacies to meet customer demand for contactless service. Demand for apps for ordering in restaurants and hotels similarly surged. Finally, companies have shown more interest in using robotic process automation to handle paperwork and reduce density in office spaces. Some banks, for instance, adopted the technology to handle the surge in loan applications from government stimulus programs.

The common feature of these use cases of automation technology is their correlation with high scores on human interaction, a subset of our overall physical proximity score, including physical closeness to others, the frequency of interactions, and the level of exposure to strangers. Our research finds the work arenas with high levels of human interaction are also likely to see some of the greatest acceleration in adoption of automation and AI.

<sup>14</sup> We use the term independent work to include the broad range of independent contractors, temporary staffing agency workers, self-employed people, freelancers, and people working through digital platforms in the so-called gig economy. See *Independent work: choice, necessity, and the gig economy*, McKinsey Global Institute, October 2016, McKinsey.com.

<sup>15</sup> Lei Ding and Julieth Saenz Molina, "Forced automation by COVID-19? Early trends from current survey population data," Federal Reserve Bank of Philadelphia, September 2020; Alexandre Kopytov, Nikolai Roussanov, and Mathieu Taschereau-Dumouchel, *Short-run pain, long-run gain? Recessions and technological transformation*, NBER working paper number 24373, March 2018; Nir Jaimovich and Henry E. Siu, *Job polarization and jobless recoveries*, NBER working paper number 18334, November 2018, nber.org.

<sup>16</sup> Susan Lund, Wan-Lae Cheng, André Dua, Aaron De Smet, Olivia Robinson, and Saurabh Sanghvi, "What 800 executives envision for the postpandemic workforce," McKinsey Global Institute, September 2020, McKinsey.com.

<sup>17</sup> National Bureau of Statistics of the People's Republic of China, stats.gov.cn.

<sup>18</sup> Megan Molteni, "COVID-19 makes the case for more meatpacking robots," *Wired*, May 2020, wired.com.

### **Work arenas vary widely in terms of the potential long-term impact of COVID-19**

The trends accelerated by COVID-19 have the potential to significantly disrupt work, but the shifts they might prompt are likely to play out differently across work arenas. Exhibit E6 offers a view of the potential disruption these trends may have across different arenas, highlighting patterns and contrasts.

Virtual business meetings and digital collaboration among coworkers seemingly became the norm during COVID-19—but mainly in the computer-based office work arena. This arena has the lowest requirements for site-dependent work because the workers in it, such as accountants, financial managers, and legal secretaries, do not require special equipment, and human interactions can be conducted virtually. In this work arena, we estimate that 70 percent of time could be spent working remotely without losing effectiveness, compared to most other work arenas, where as little as 5 to 10 percent of work could be done remotely.

By contrast, digital interactions and transactions have risen much more uniformly across work arenas, although higher rates of adoption may occur in two arenas: on-site customer interaction, fueled by the rise of e-commerce and food delivery, and computer-based office work, where use of digital collaboration tools and digital channels has spiked. Even in medical care and classroom and training, both work arenas with high physical proximity, the use of digital tools has risen significantly during the pandemic. The medical care arena has seen a sharp acceleration in telemedicine. In education, the classroom migrated to the laptop during the pandemic, but that is likely to stick only in higher education and workforce training after the pandemic.

Greater deployment of robots, AI, and robotic process automation is also more marked in arenas with higher physical proximity. Potential acceleration of automation is most likely to occur in the on-site customer interaction and computer-based office work arenas, where we estimate that the share of workers possibly displaced will increase by 7 to 8 percentage points. Automation may also rise in the indoor production and warehousing arena as companies strive to maintain social distance, replace sick workers, and adjust to surges in demand for manufactured goods and delivery-based services from warehouses during and after the pandemic. In outdoor production and maintenance, we see very little likely increase in automation.

Overall, potential long-term work disruptions triggered by COVID-19 are perhaps best measured by changes in workforce transitions by 2030. We find that the most changes are likely in the four work arenas with relatively high physical proximity scores: on-site customer interaction, leisure and travel, computer-based office work, and indoor production and warehousing. We estimated changes in net labor demand and occupation transitions using a granular task- and activity-based framework, explained in detail in the next section, and found clear differentiation in the potential outcomes across our ten work arenas.

**In the computer-based office work arena, 70 percent of time could be spent working remotely without losing effectiveness, compared to most other arenas, where as little as 5 to ten percent of work could be done remotely.**

## Trends accelerated by COVID-19 may play out differently across different arenas.

Potential change in impact of workforce trends due to COVID-19 in the United States

High disruption  Low disruption

Work arena	% of workforce, US 2018	Change compared to pre-COVID-19 scenario					
		Potential for remote work	Digital adoption <sup>1</sup>	Automation adoption	Labor demand growth	Occupation transitions	Overall disruption <sup>2</sup>
		% of time that can be remote	Percentage point change in adoption of digital tools <sup>1</sup>	Percentage point change in share of workers displaced by 2030	Percentage point change in net labor demand growth by 2030	Percentage point change in share of workers changing occupations by 2030	
On-site customer interaction	12	12	18	8	-14	8	High
Leisure and travel	7	5	11	8	-10	4	
Computer-based office work	31	70	17	7	0	3	
Indoor production and warehousing	21	6	11	4	2	1	
Classroom and training	7	31	15	2	2	0	Moderate
Medical care	7	6	15	5	6	0	
Home support	3	13	10	0	16	0	
Personal care	2	11	10	3	8	-2	
Transportation of goods	3	10	13	4	14	-3	Low
Outdoor production and maintenance	8	3	7	1	6	-3	

1. Calculated based on McKinsey Global Institute's Digitization Index on level of digitization by sector mapped to work arena, including use of digital assets, digital usage, and digital workers, and adjusted for COVID-19 based on McKinsey surveys indicating consumer adoption of digital channels and platforms by sector.

2. Ranking based on occupation transitions column.

Note: Occupations grouped into ten work arenas based on overall physical proximity score that combines O\*NET data for human proximity in the workplace, including for physical proximity, face-to-face discussions, and dealing with external customers, with O\*NET data on types of work environments and work environment score (average of O\*NET score for workplaces such as outdoor/indoor and environmentally controlled, and our assessment of site dependence of occupations based on various O\*NET data).

Source: Employment and Training Administration, US Department of Labor; O\*NET OnLine; US Bureau of Labor Statistics; McKinsey Global Institute analysis

## The mix of occupations within economies may shift, with little or no job growth in low-wage occupations

Before the pandemic, we found that nearly all low-wage workers who lost jobs could move into other low-wage occupations; for instance, a data entry worker could shift into retail or home healthcare. But given the trends accelerated by COVID-19, now we estimate that to remain employed, more than half of the low-wage workers currently in declining occupations would need to shift to occupations in higher wage brackets that require different skills.

The trends accelerated by COVID-19 may displace more workers from jobs than our previous future of work scenarios implied, and in different occupations, while also creating more labor demand in some occupations. We model growth in net labor demand for different occupations in each country based on displacement related to automation, digitization, and the other trends the pandemic has accelerated, as well as macro trends that will spur job growth in the decade ahead: rising incomes as GDP recovers, aging populations, increased infrastructure investment, rising education levels, climate change and the transition to renewable energy, and the marketization of unpaid work.<sup>19</sup> We assume that economies will return to full employment based on the size of their workforce by 2030, so our results shed light on the mix of jobs in an economy rather than on overall employment rates. As noted earlier, we fully acknowledge the uncertainty of these assumptions but rely on a well-reasoned set of factors to construct a plausible scenario.

Our findings reveal that a markedly different mix of occupations may emerge after the pandemic. Exhibit E7 shows the change in employment share across occupation groups between 2018 and 2030. Although results vary across the eight focus countries, we generally find that the largest net growth is likely to be in healthcare, STEM, and transportation jobs, and the largest declines in customer service jobs in retail and hospitality, food service, production work, and office support roles. In India and China, we see declines in the share of agricultural occupations as well, in line with the longer-term structural transformation of the labor forces in those countries.

Compared to our pre-COVID-19 estimates, we expect to see the largest negative impact of the pandemic falling on workers in food service and customer sales and service roles, as well as less-skilled office support roles. Jobs in warehousing and transportation may increase as a result of the growth in e-commerce and the delivery economy, but the increase in delivery and transportation jobs does not offset the many low-wage jobs that may decline. In the United States, customer service and food service jobs could fall by a total of 4.3 million, while transportation jobs could grow by nearly 800,000. Demand for workers in the healthcare and STEM occupations could grow more than before the pandemic, reflecting increased attention to health as populations age and incomes rise as well as the growing need for people who can create, deploy, and maintain new technologies.

Looking at changes in occupations across countries, a common trend is apparent: Declines in net job growth are likely to concentrate in low- and middle-wage positions, such as customer service jobs in retail, hospitality, and food service, while net job creation may occur primarily in high-wage jobs, such as health care and STEM (Exhibit E8). This trend is markedly different from the dynamics seen in many countries before the pandemic, when net job losses were concentrated in middle-wage occupations in manufacturing as automation took over routine tasks while growth continued in low- and high-wage jobs.<sup>20</sup> Then, we found that nearly all low-wage workers who lost jobs could move into other low-wage occupations—for instance, a data entry worker could move into retail or home healthcare. But given the trends accelerated by COVID-19, now we estimate that more than half of the low-wage workers currently in declining occupations may need shift to occupations requiring different skills in higher wage brackets to remain employed.

<sup>19</sup> See Technical Appendix for more detail.

<sup>20</sup> The decline of middle-skill and middle-wage jobs has been widely discussed in academic literature. See David H. Autor, and David Dorn, "The growth of low-skill service jobs and the polarization of the US labor market," *American Economic Review*, August 2013, Volume 103, Number 5; David Autor and Elisabeth B. Reynolds, *The nature of work after the COVID crisis: Too few low-wage jobs*, Brookings Institution, Hamilton Project essay number 2020-14, July 2020.

# 4.3M

Possible fall in customer service and food service jobs in the United States, compared to prepandemic estimates

**The mix of occupations may shift in all countries by 2030 in the post-COVID-19 scenario.**

**Estimated change in share of total employment,  
post-COVID-19 scenario, percentage points, 2018–30<sup>1</sup>**

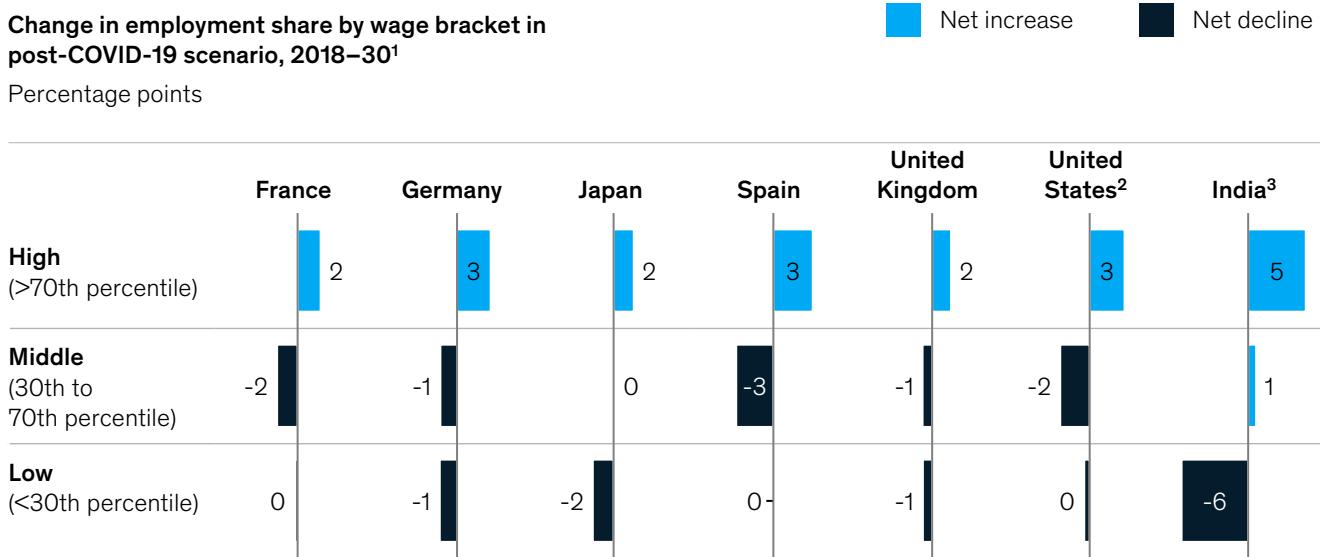
Increased share  Decreased share

Occupational category	Advanced						Emerging	
	France	Germany	Japan	Spain	United Kingdom	United States	China	India
Health aides, technicians, and care workers	1.6	1.9	1.4	1.5	1.4	2.2	2.7	1.0
Health professionals	0.8	0.7	0.9	1.0	0.7	1.2	1.3	0.5
Creatives and arts management	0.5	0.4	0.4	0.5	0.4	0.2	0.4	0.5
STEM professionals	1.0	1.2	1.0	0.9	1.0	1.0	1.2	0.8
Managers	0.7	0.6	0.4	0.7	0.9	0.6	0.5	0.6
Transportation services	0.3	0.6	0.1	0.3	0.1	0.3	0.9	0.4
Business and legal professionals	0.3	0.3	1.1	0.5	0.3	0.2	1.1	0.8
Community services	-0.3	-0.1	0.1	-0.1	-0.3	-0.2	0.8	0.2
Builders	-0.3	0.0	-0.2	-0.3	-0.3	-0.1	0.1	1.0
Educator and workforce training	0.0	0.4	-0.1	0.0	0.2	-0.1	0.4	0.7
Property maintenance	0.4	-0.2	-0.2	0.0	-0.2	0.1	0.5	-0.4
Food service	-0.6	-0.3	-1.1	-1.6	-0.7	-0.7	0.5	0.7
Customer service and sales	-0.9	-1.9	0.2	-0.5	-0.8	-1.1	1.3	0.3
Mechanical installation and repair	-0.2	-0.2	0.0	-0.2	-0.1	-0.2	-0.1	0.5
Office support	-2.1	-2.3	-2.2	-1.4	-2.2	-2.6	0.3	0.3
Production and warehousing work	-1.0	-1.0	-1.7	-0.9	-0.3	-0.7	-3.8	1.0
Agriculture	-0.2	-0.3	-0.3	-0.4	0.0	-0.1	-8.0	-8.9

1. Pre-COVID-19 scenario includes effects of eight trends: automation, rising incomes, aging populations, increased technology use, climate change, infrastructure investment, rising education levels, and marketization of unpaid work. Post-COVID-19 scenario includes all prepanemic trends as well as accelerated automation, accelerated e-commerce, increased remote work, and reduced business travel.

Source: McKinsey Global Institute analysis

**In the post-COVID-19 scenario, almost all labor demand growth could be in high-wage occupations.**



1. Annual wages calculated by multiplying hourly mean wage by number of working hours in a year. For occupations with no published hourly wage, annual wage calculated from reported survey data.

2. Uses data from 6-digit Standard Occupational Classification codes; results may differ from similar analysis that uses 2-digit SOC codes due to slightly different proportions of population captured in each wage tercile.

3. For India, low wage: occupations earning less than the 40th percentile of median annual wages; middle wage: 40th percentile to 80th percentile; high wage: higher than 80th percentile.

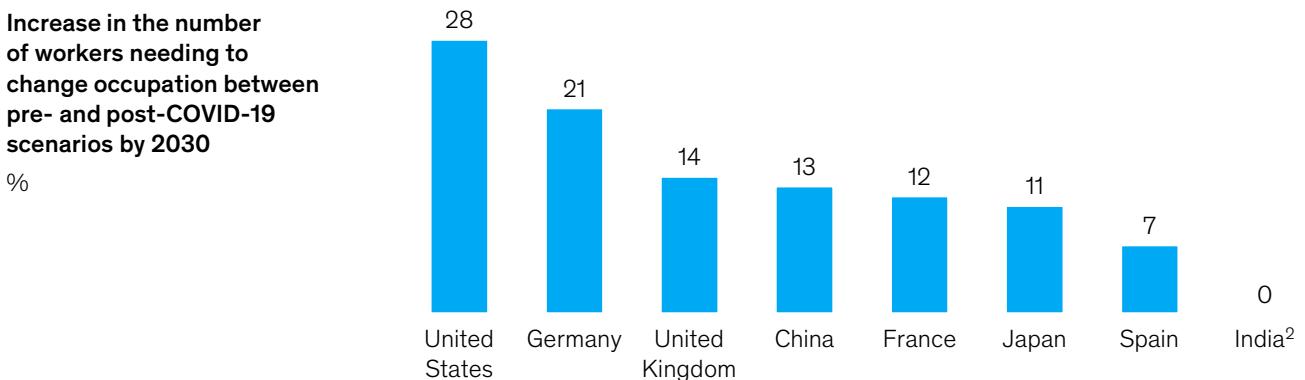
Note: China excluded due to limited data availability on income by occupation.

Source: McKinsey Global Institute analysis

**Up to 25 percent more workers may need to switch occupations than before the pandemic, and the retraining challenge may be harder**

Given the concentration of job growth in high-wage occupations and declines in low-wage occupations, the scale and nature of workforce transitions required in the years ahead will be challenging, according to our research. Across the eight focus countries, 107 million workers, or 1 in 16, will need to find a different occupation by 2030 in our post-COVID-19 scenario. This is 12 percent more across countries than we estimated before the pandemic, and as much as 25 percent more in advanced economies (Exhibit E9).

**In the post-COVID-19 scenario, occupation transitions may increase by as much as 25 percent across countries compared to before the pandemic.**



<b>Occupation transitions in post-COVID-19 scenario, % of 2030 workforce<sup>1</sup></b>	10	9	8	7	9	9	8	3
<b>Occupation transitions in post-COVID-19 scenario, million<sup>1</sup></b>	17	4	3	54	2	6	2	18

1. Individuals need to transition occupation if they are in an occupation that sees net declining labor demand relative to 2030 baseline. The pre-COVID-19 scenario includes the effects of eight trends: automation, rising incomes, aging populations, increased technology use, climate change, infrastructure investment, rising education levels, and marketization of unpaid work. The post-COVID-19 scenario includes all prepandemic trends as well as accelerated automation, accelerated e-commerce, increased remote work, and reduced business travel.
2. Job transitions remain flat pre- and postpandemic because of fewer services jobs available into which low-wage construction workers could transition. Excludes transitions among farm workers; if farm jobs are included, transitions fall prepandemic compared to postpandemic as there are fewer transitions to secondary and tertiary sectors.

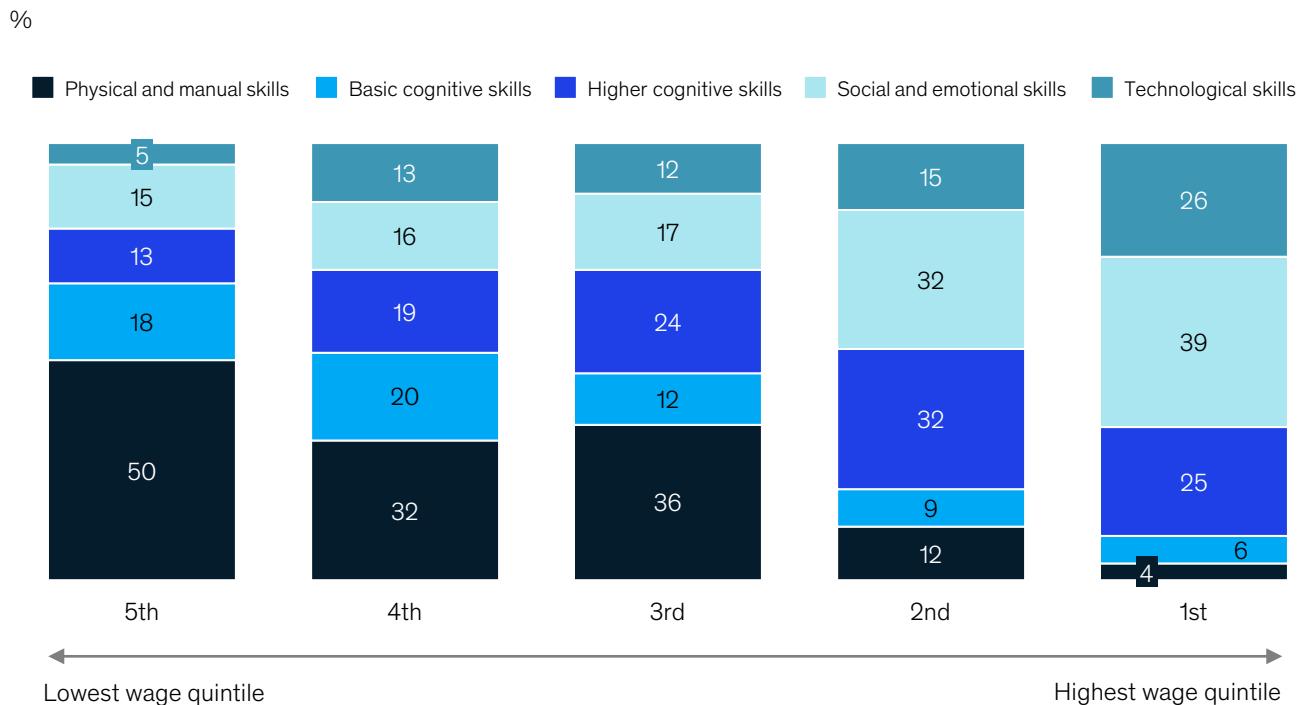
Source: McKinsey Global Institute analysis

Workers needing to make those transitions may require more significant training and acquisition of new skills to secure jobs in growing occupations. Our research suggests that between 60 and 75 percent of the workers needing to change occupations in advanced economies currently hold jobs in the lowest two wage quintiles. Before the pandemic, our modeling found that those workers could have expected to transition to a new occupation in the same wage group, while workers holding middle-wage jobs would need to learn skills to enable them to move up one wage quintile for a new position. In our post-COVID-19 scenario, we find not only that a larger share of workers will likely need to transition out of the bottom two wage quintiles but also that a majority of them will need new, more advanced skills to move to occupations that are one or even two wage quintiles higher. Overall, we find that just over half of workers in the lowest two wage quintiles who need to switch occupations will need move into occupations in higher wage quintiles. That compares to our prepandemic estimates of just 6 percent needing to move up.

The skill mix required of the workforce going forward—and particularly among those changing occupations—differs from today. Exhibit E10 shows the predominant skills required by jobs in each wage quintile by share of time spent working. Workers in occupations in the lowest wage quintile, for instance, use basic cognitive skills and physical and manual skills 68 percent of the time, but in the middle quintile, use of these skills occupies 48 percent of time spent. In the highest two quintiles, those skills account for less than 20 percent of time spent.

**Workers will need to learn more social and emotional skills, as well as technological skills, in order to move into occupations in higher wage brackets.**

**Time spent using skills in each skill category by wage quintile in the United States<sup>1</sup>**



1. Using O\*NET data, more than 2,000 work activities for more than 800 occupations were classified according to the primary skill used.

Source: Employment and Training Administration, US Department of Labor; O\*NET OnLine; US Bureau of Labor Statistics; McKinsey Global Institute analysis

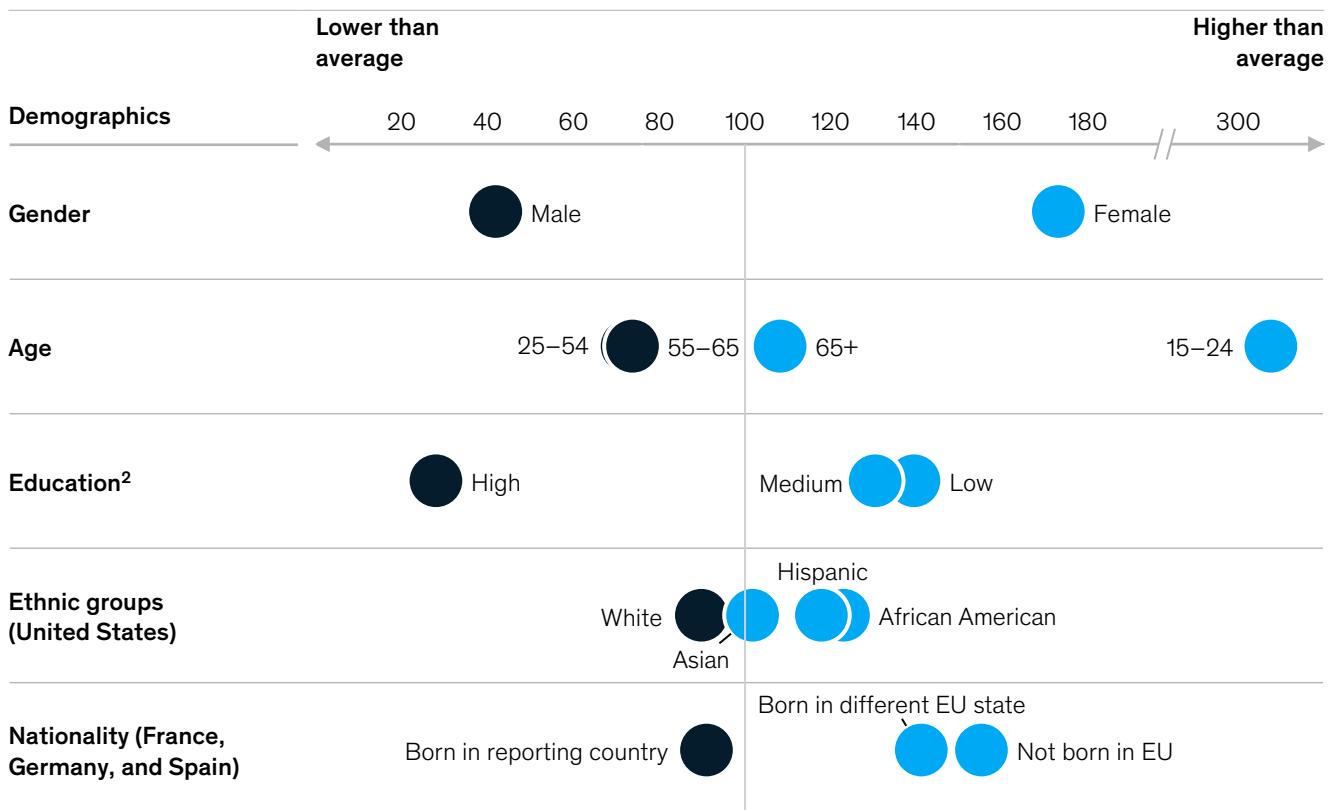
In Europe and the United States, workers with less than a college degree, members of ethnic minority groups, and women are more likely to need to change occupations after COVID-19 than before. In the United States, people without a college degree are 1.3 times more likely to need to make transitions compared to those with a college degree, and Black and Hispanic workers are 1.1 times more likely to have to transition between occupations than white workers. In France, Germany, and Spain, the increase in job transitions required due to trends influenced by COVID-19 is 3.9 times higher for women than for men.<sup>21</sup> Similarly, the increase in occupational changes will hit younger workers more than older workers, and individuals not born in the European Union more than native-born workers (Exhibit E11).

<sup>21</sup> See also "COVID-19 and gender equality: Countering the regressive effects," McKinsey Global Institute, June 2020, McKinsey.com.

**Women, young, less-educated workers, ethnic minorities, and immigrants may need to make more occupation transitions after COVID-19.**

**Estimated percentage increase in number of occupation transitions between pre- and post-COVID-19**

Indexed to overall percentage increase=100, weighted average of United States, France, Germany, and Spain<sup>1</sup>



1. Individuals need to transition occupation if they are in an occupation that sees net declining labor demand relative to 2030 baseline. The pre-COVID-19 scenario includes the effects of eight trends: automation, rising incomes, aging populations, increased technology use, climate change, infrastructure investment, rising education levels, and marketization of unpaid work. The post-COVID-19 scenario includes all prepanemic trends as well as accelerated automation, accelerated e-commerce, increased remote work, and reduced business travel.
2. For US: Low (less than high school), Medium (high school, some college or associate degree), High (Bachelors degree and above); for France, Germany, and Spain: Low (ISCED 0-2, primary and lower secondary), Medium (ISCED 3-4, upper secondary and postsecondary non-tertiary), High (ISCED 5-8, bachelors, masters, and doctoral degree).

Source: National statistics agencies; McKinsey Global Institute analysis

## **Companies and policy makers can help facilitate workforce transitions**

Innovative and equitable actions taken by business leaders and policy makers could help workers make the big job transitions that we see as an enduring legacy of COVID-19. Already during the crisis, companies and governments made changes that suggest a path toward the future.

### **Businesses can reimagine where and how work is done and increase reskilling efforts**

Businesses looking beyond the pandemic have an opportunity to reimagine how and where work is done. The crisis demonstrated that rapid changes in working practices and the jobs people do can be accomplished quickly. The key is to focus on the tasks and activities required rather than on whole jobs. Redesigning work in this way can streamline processes, increase efficiency, and enhance operational flexibility and agility.

Many employers are devising hybrid remote working strategies for the long term to expand access to talent, increase employee satisfaction, and reduce real estate costs. Doing so will require careful analysis to determine which activities can be done remotely without a loss of productivity, and then devising an intentional approach to when teams of workers are remote and when they are in the office together.<sup>22</sup> Maintaining a cohesive culture and developing practices and programs to keep employees connected and on a career path even at a distance will be key. Mentorship, development, and onboarding of new employees may be somewhat more complicated but not impossible in hybrid remote work models.

Even before the pandemic, many companies helped workers acquire skills they needed for new jobs and created career pathways with upward mobility. After the pandemic, the need for such programs will be more acute. Walmart operates internal academies to develop the best hourly workers into store managers and, more recently, supply chain professionals and technology specialists.<sup>23</sup> In 2020, IBM, Bosch, and Barclays started apprenticeship programs to train workers for tech jobs with career pathways.<sup>24</sup> Studies have found that retraining existing employees with proven track records is typically far more cost-effective than hiring new people.<sup>25</sup>

Other possible measures include changes in hiring practices to put the focus on skills rather than academic degrees. This can expand the pool of available candidates and increase diversity for companies while helping to ease the broad workforce transitions that will play out across all countries. Google, Hilton Hotels, Ernst & Young, and IBM are among a growing number of employers that have changed job postings to remove degree requirements and focus on skills; they have seen marked increases in new hires without college degrees for some roles.

Finally, companies could give greater consideration to diversity and inclusion to counter the regressive impact of COVID-19. Business leaders may increase their focus and innovation in hiring and retaining diverse groups.

### **Policy makers could focus on expanding digital infrastructure and supporting workers in transition**

For policy makers, easing workforce transitions would be a way to avoid high unemployment or have workers drop out of the labor force. Expanding digital infrastructure is important, given the pandemic-fueled boost to the online economy. Even in advanced economies, 19 percent of households in rural areas, and 13 percent of households overall, lack access to internet service.<sup>26</sup> This precludes them from educational and work opportunities. In the United States, McKinsey research found that learning losses from the pandemic could

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<sup>22</sup> See Andrea Alexander, Aaron De Smet, Mihir Mysore, "Reimagining the postpandemic workforce," July 2020, McKinsey.com.

<sup>23</sup> William Kerr, "Walmart's workforce of the future," July 2019, Harvard Business School, hbs.edu.

<sup>24</sup> Agam Shah, "Seeking Tech Talent, Companies Kickstart Apprenticeship Programs," January 2020, *The Wall Street Journal*, wsj.com.

<sup>25</sup> Anand Chopra-McGowan and Srinivas B. Reddy, "What would it take to reskill entire industries?," Harvard Business Review, July 2020, hbr.org.

<sup>26</sup> International Telecommunication Union, "Measuring digital development," November 2020.

wipe out the equivalent of one year of salary on average—and more for underrepresented ethnic groups.<sup>27</sup>

Various options exist for policy makers to support workers during job transitions. In the early days of the pandemic, many countries extended financial assistance to workers who lost jobs, and data on personal income and spending in the United States in subsequent months confirmed that these actions supported consumption and helped to avoid more severe and sustained economic damage.<sup>28</sup> In an era in which midcareer workers may need to retrain and switch occupations, and during which lifelong learning may become a reality rather than just a catchphrase, new or expanded forms of income support could help ease the transition.

Revamping labor market policies and benefits for the growing independent workforce is another option. For the first time during the pandemic, many independent and gig workers were offered the same support extended to hourly wage employees in unemployment and other benefits.<sup>29</sup> So far in some countries, they were mostly temporary measures. Further work to craft permanent policies better suited to a modern labor market could help. For example, portable benefits that allow independent workers to work across gig platforms while accumulating medical and other benefits could enhance such jobs.

Licensing and certification requirements for many occupations could be reviewed. Licensing ensures that professionals have the requisite skills and training and protects consumers. But it can also limit competition and occupational mobility. During the pandemic, for instance, several US states and the federal government eased scope-of-practice restrictions on nurse practitioners and doctors to enable them to care for COVID-19 patients. Nurse practitioners were allowed to provide some care that only doctors could previously perform for patients insured by Medicare in nursing homes, and many states allowed doctors to provide care via telemedicine without needing a state license. Beyond healthcare, occupational licenses can pose barriers to new entrants into many jobs.<sup>30</sup>

Finally, local government leaders could consider the value proposition of their location. With more workers shifting to remote work and pondering where to set up home offices, smaller cities and areas left out of the boom over the past decade have a new opportunity to attract residents and revitalize local growth.

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The impact of the pandemic on work with high physical proximity delivered a major shock to the workforce and will continue to influence its shape and direction in the years to come. Jobs that once helped offset labor displacement are among those most affected by the long-term repercussions of COVID-19, and workers will face unprecedented transitions requiring wholly new skills to advance into the more highly paid jobs being created. Businesses and policy makers have a role to play in rethinking retraining and finding new ways to help workers develop the skills they will need. If a robot can learn to flip hamburgers, then a shop clerk can learn to be a nurse practitioner, a cybersecurity analyst, or a wind turbine service technician—with the right support.

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<sup>27</sup> See Emma Dorn, Jimmy Sarakatsannis, and Ellen Viruleg, "Covid 19 and student learning in the United States," June 2020, McKinsey.com.

<sup>28</sup> See, for example, "GDP first quarterly estimate, UK: July to September 2020," UK Office for National Statistics, November 2020, ons.gov.uk. Also see Scott Baker et al., *Income, liquidity and the consumption response to the 2020 economic stimulus payments*, NBER working paper number 27097, September 2020, nber.org.

<sup>29</sup> *What have platforms done to protect workers during the coronavirus (COVID-19) crisis?*, Organisation for Economic Co-Operation and Development (OECD), September 2020, oecd.org.

<sup>30</sup> "COVID-19 brings changes to NP scope of practice," *American Journal of Nursing*, August 2020, Volume 120, Issue 8, p. 14.



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