Compete.
Council on Competitiveness

# National Commission on Innovation & Competitiveness Frontiers

## A Council Plan to Redefine 21st Century Productivity, Prosperity and Security

## Unleashing Capabilities for Work and Entrepreneurship

Working Group 4 Charter

# Setting the Stage for the Commission Working Groups

Despite significant strengths in its innovation capabilities and capacities—documented in the Council on Competitiveness *2018 Clarion Call for Competitiveness*—U.S. competitiveness is dynamic and ever transforming. And our nation's comparative position in the global competitiveness arena can change rapidly.

Now and into the future, U.S. companies, industries and our national and regional economies that expect to compete will have to rise to the challenge of this dynamic, and reorganize for an age of growing technological, economic and political disruption. Our government, communities and our education system must be prepared to support rapid change, and help those who are displaced or negatively affected by technological and competitive change.

When the United States controlled the global direction of technology, we were positioned to control our economic destiny. That is no longer guaranteed.

The United States must take stock. We must assess if our innovation ecosystem and its investments are enough to maintain our global economic and technological leadership. And, as technology seeps into nearly every aspect of American life, our national leaders and our governments at every level must bolster their knowledge and response capabilities to match the strengthening global competition, technological change and coming disruptions.

**What will the United States do in the face of challenges at home and coming from abroad?**

Will we plan for the long term, transforming challenge to opportunity? Will we put in place the talent, innovation capital and infrastructure necessary for continuing success in the decades to come? Will we recognize the multifaceted nature of today's global innovation race, and come together across all sectors to form a new "innovation compact" for economic growth, productivity and inclusive prosperity?

To confront and overcome critical challenges facing the U.S. innovation engine…

To create momentum in the United States to outpace the rest of the world in innovation capacity, capability and competitiveness…

To build on the Council's history of work in defining, articulating and activating America's innovation movement…

And to develop new partnerships and efforts to launch and scale innovation-based research, businesses and ventures in the United States.

The Board and Executive Committee of the Council has formed the National Commission on Innovation & Competitiveness Frontiers (Commission) to prepare the Nation for a new, unfolding and evolving innovation reality that will shape the Nation's prosperity for the next half century.

In the first year of the Commission's work, the Council will build a powerful set of recommendations with **Working Groups focused on three core pillars:**

1. **Developing and Deploying at Scale Disruptive Technologies.**
2. **Exploring the Future of Sustainable Production and Consumption, and Work.**
3. **Optimizing the Environment for the National Innovation System.**

# Working Group 4: Unleashing Capabilities for Work and Entrepreneurship

## Mission

The Unleashing Capabilities for Work and Entrepreneurship Working Group seeks to identify the key challenges and opportunities that are reshaping the future of work—such as demographics, geography, changing skills needs and organizational models—and, in understanding those, spark entrepreneurial activity, enhance innovation and drive competitive advantage through the productivity and resilience of the American workforce.

First, the Working Group will explore the rapid evolutions unfolding in the American workforce as it relates to the production and service revolutions unfolding in real-time across the U.S. economy. Up and down the career ladder, and spanning the workforce landscape, mega trends are affecting U.S. labor markets, the occupational mix in the country, what people do on the job, and the skills they need to compete and succeed in a fiercely competitive global marketplace. The impacts of the current COVID-19 pandemic further highlight the impact times of crises have on particular sectors and regions of the economy. Unemployment has increased at unprecedented rates, and the near-term and long-term costs of closing of the economy are yet to be fully determined.[1] By assessing and understanding ongoing disruptions to the workforce, this Working Group can identify solutions that will better prepare the U.S. workforce to leverage those changes for greater innovation and competitive advantage.

Second, this Working Group will examine what it takes for entrepreneurs to thrive in a complex environment—building and deploying at scale the innovations to transform markets, spur new industries and create jobs. Traditionally the backbone of U.S. innovation and prosperity, the current entrepreneurial landscape across the nations and within regions[2] is also challenged by the COVID-19 pandemic. The future of entrepreneurship—in a nation known for its entrepreneurial spirit and success—will depend increasingly on better aligning education, skills, competencies and training to market opportunities, and building new partnerships between government, industry, universities and labor to create environments in which creative thinkers, problem solvers and risk takers can explore, innovate and create solutions to enhance U.S. competitiveness.

To accomplish these goals, the Working Group will develop and prioritize concrete, sector-appropriate (government, industry, academia, national laboratories, workforce) recommendations to energize regions, labor markets and entrepreneurship in the United States—aimed at developing a more inclusive, diverse, innovative and entrepreneurial workforce to drive competitive advantage in the United States and increase prosperity for all Americans.

1 38.6 Million Have Filed For Unemployment Since March. NPR. May 21, 2020.

2 The Council on Competitiveness has been a thought leader in regional innovation starting with the seminal 2001 Report on the Clusters of Innovation: Regional Foundations of US Competitiveness—including deep dives into five U.S. regions: Atlanta-Columbus, GA; Pittsburgh, PA; Research Triangle Area, NC; San Diego, CA; and Wichita, KS—and follow on Council on Competitiveness reports in partnership with the U.S. Department of Commerce Economic Development Administration.

## Timeframe

The Working Group will:

- Form in the Spring/Summer of 2020, following the June 16, 2020, Second National Commissioners Meeting.
- Convene virtually, once-a-week throughout the Summer and Fall of 2020.
- Develop in these Working Group sessions concrete, actionable recommendations in support of the National Commission's Year 1 call to action—to be released December 17, 2020, at the Council on Competitiveness National Competitiveness Forum.

The efforts and key findings captured in Council reports over the years such as Exploring Innovation Frontiers Initiative (EIFI), which made the competitiveness case for strengthening regional and national level entrepreneurial and innovation ecosystems; and Work, which surveyed over a decade's worth of Council on Competitiveness initiatives and reports to identify and quantify a widening skills gap in the United States threatening America's prosperity, as well as proposing recommendations to re-tool and re-skill the American workforce; and Transform, which highlighted the need to engage a broader swath of the American workforce in the innovation ecosystem, have made the case for education and training to foster science, engineering, technology, and innovation, as well as entrepreneurship. Future growth in the U.S. economy—as well as advances in productivity and inclusive prosperity—will depend both on modernizing how we educate, support and enable our workforce for success in a rapidly transforming global environment, as well as tweaking, optimizing and turbo-charging our entrepreneurial engine.

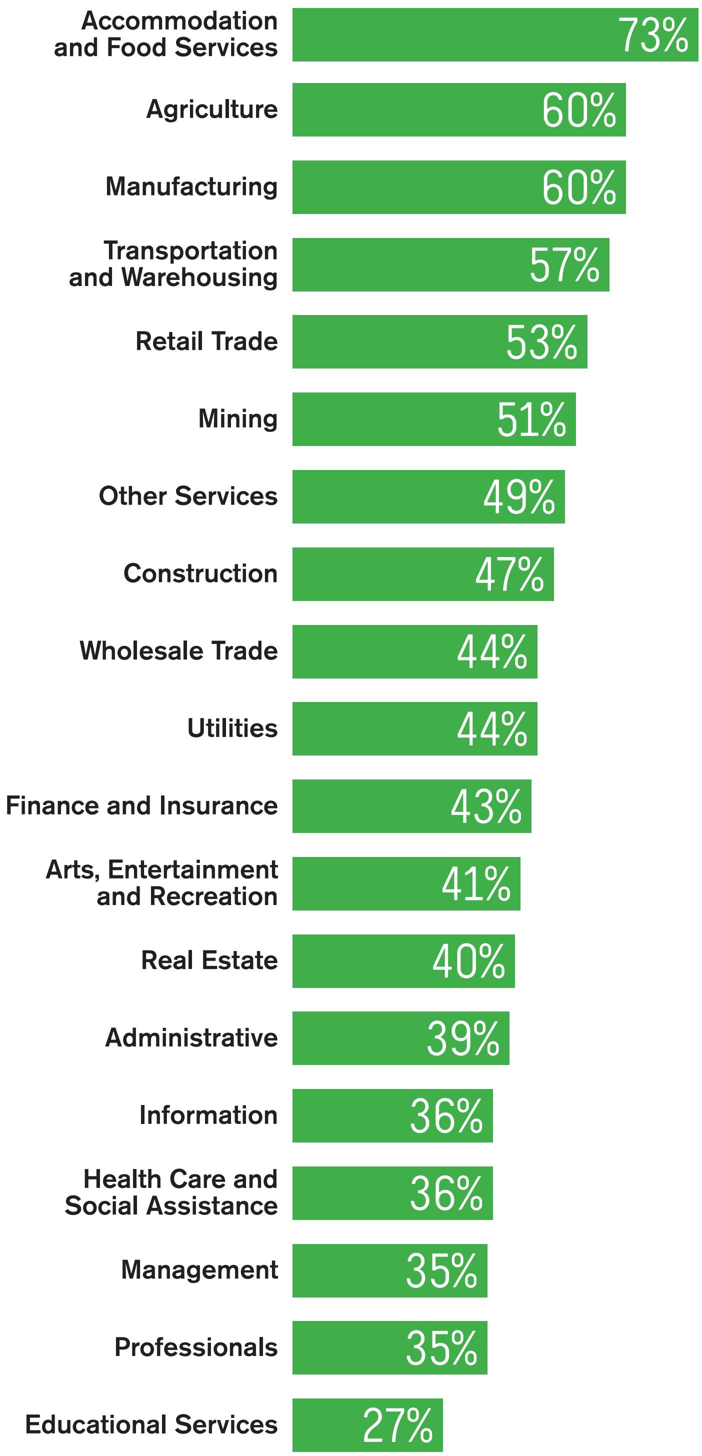
## Issues

**Future(s) of work.** New technologies make entirely new forms of work possible—work without humans, work in which humans and technologies form teams, work performed in remote locations and, potentially, entirely new forms of work organized using today's powerful computing, internet and communications technologies. Rapid advances in cognitive science will provide new insight on creativity and how to better analyze, solve problems, adapt to new situations and make decisions. This new knowledge will be applied to improve how we work together, manage teams, design organizations, and interact with customers and machines.

However, how these opportunities are created and how the nature of work will change for employers and employees, will vary across sectors. The risk of automation depends greatly on the industry, and the levels of education and training of the workforce. For example, the accommodation and food services, agriculture and manufacturing sectors have the largest share of tasks that could be automated (between 60 and 73 percent), whereas people working in the educational field only spend about 27 percent of their time on such tasks.

**Figure 1. Projections for Workforce Downsizing Due to Disruptive Technologies in Different Sectors and Industries**

Adapted from:: These are the Industries most likely to be taken over by Robots, World Economic Forum. 2019.
Data source: McKinsey via Bridgewater Associates




**Increasing urban-rural divide.** Regional variations and clusters of different industries across the country pose a new challenge: an increasing urban-rural divide. Just as new technologies and the diffusion of digital knowledge and tools can provide new opportunities for some workers, these opportunities vary—by sectors and, in a complex way, by geography (between states and regions; between regions; between states; between metropolitan statistical areas; etc.) The COVID-19 pandemic further highlights the divide, particularly in remote and rural areas with respect to accessing healthcare, infrastructure (such as broadband) and coping with underlying economic conditions.

In the current COVID-19 social distancing culture, it may appear as if rural areas are at lower risk for contagion and spread. Lower density populations may slow the spread of infection but rural populations face more pressing conditions. Rural populations tend to have a higher percentage of elderly citizens and higher rates of chronic illness as compared to urban areas. These trends put incredible stress on local communities and impact quality of life and economic stability.

Questions remain regarding the capability and capacity of healthcare services to support patients in rural areas. From doctor shortages to limited hospital capabilities, the pandemic is pushing an already stressed healthcare systems in remote and rural communities to its limit.[3] Beyond and inclusive of current effects, the ability of rural communities to absorb the shocks of crises limit the resiliency and ability of the communities to weather disruption and recover.

In addition to healthcare, limited broadband access has limited the ability to communicate across borders and has also impacted the ability to conduct telehealth services in remote areas.

3 The coronavirus may hit rural America later—and harder. Vox. March 28, 2020.

**Figure 2. Rural Residents Are More Likely to Face Barriers in Health Care**

Residents' health care issues by metro status and demographic characteristics

Adapted from: Rural America Is Starting To Feel the Impact of the Coronavirus. Center for American Progress. April 28. 2020.
Data source: Board of Governors of the Federal Reserve System, "Survey of Household Economics and Decisionmaking," available at https://www.federalreserve.gov/consumerscommunities/shed.htm (last accessed April 2020).

| | Share Without Health Insurance | Share Who Skipped Health Care | Share Who Can Cover $400 in an Emergency | Share With Medical Debt Due to Unexpected Health Emergency |
|---|---|---|---|---|
| **Non-metro Area** | 9.4% | 28.3% | 55.4% | 48.8% |
| **Metro Area** | 9.5% | 24.8% | 58.9% | 38.0% |
| **Non-college in Non-metro Areas** | 10.9% | 31.1% | 50.0% | 54.0% |
| **Non-college in Metro Areas** | 12.1% | 29.4% | 49.2% | 44.5% |
| **College Educated in Non-metro Areas** | 3.0% | 16.9% | 77.1% | 28.2% |
| **College Educated in Metro Areas** | 4.4% | 15.9% | 77.6% | 25.6% |
| **White in Non-metro Areas** | 7.8% | 26.7% | 59.1% | 46.7% |
| **White in Metro Areas** | 7.0% | 22.2% | 66.30% | 34.0% |
| **Black in Non-metro Areas** | 17.3% | 31.9% | 33.6% | 81.0% |
| **Black in Metro Areas** | 13.5% | 28.8% | 38.8% | 53.3% |

Note: Skipping health care includes not going to the doctor, not taking prescribed medicine, and not going to follow-up visit.

**Figure 3. Rural-urban Differences in Percentage of Adults Age 18+ With Specific Chronic Health Conditions, 2013**

Adapted from: [Why Coronavirus Could Hit Rural Areas Harder. Syracuse University. March 2020.]

Data source: https://www.ruralhealthinfo.org/topics/chronic-disease#urban-comparison; Chart: Shannon Monnat

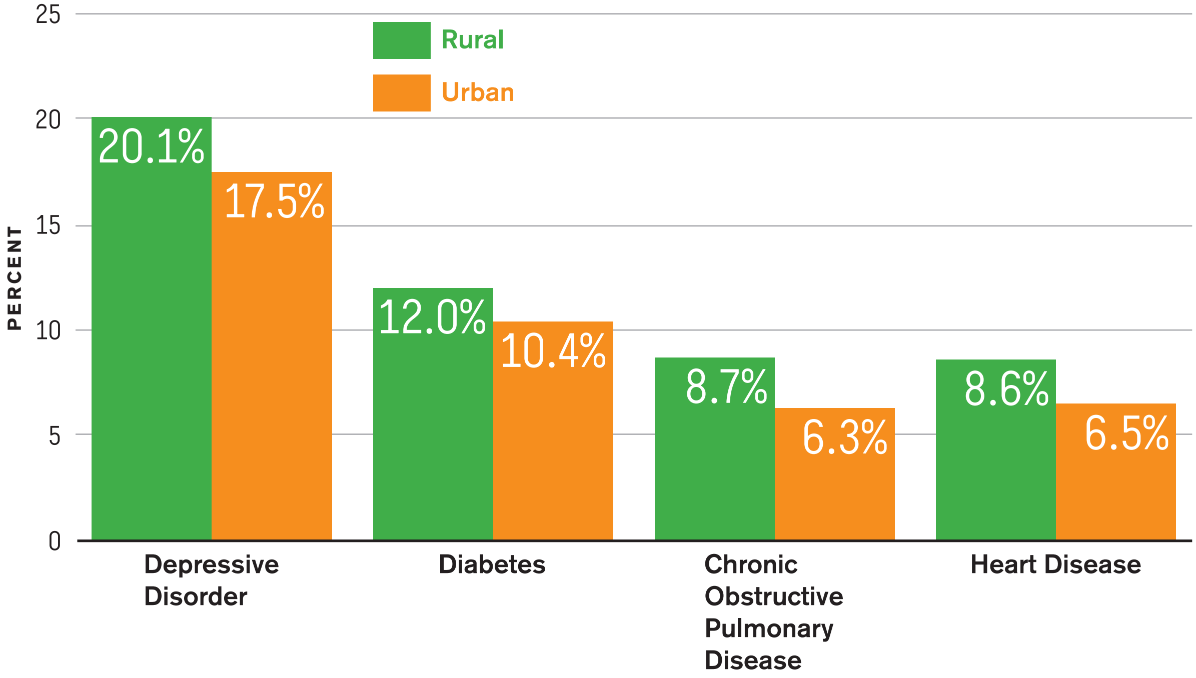



**Figure 4. Job Growth in America**

Adapted from: The Divide Between Rural and Urban America, in 6 Charts. US News. March 20, 2017.

Data source: Integrated Public Use Microdata Series: Version 6.0. 2008-2015 ACS.

Since 2008, job growth in metropolitan areas has outpaced that in rural areas.

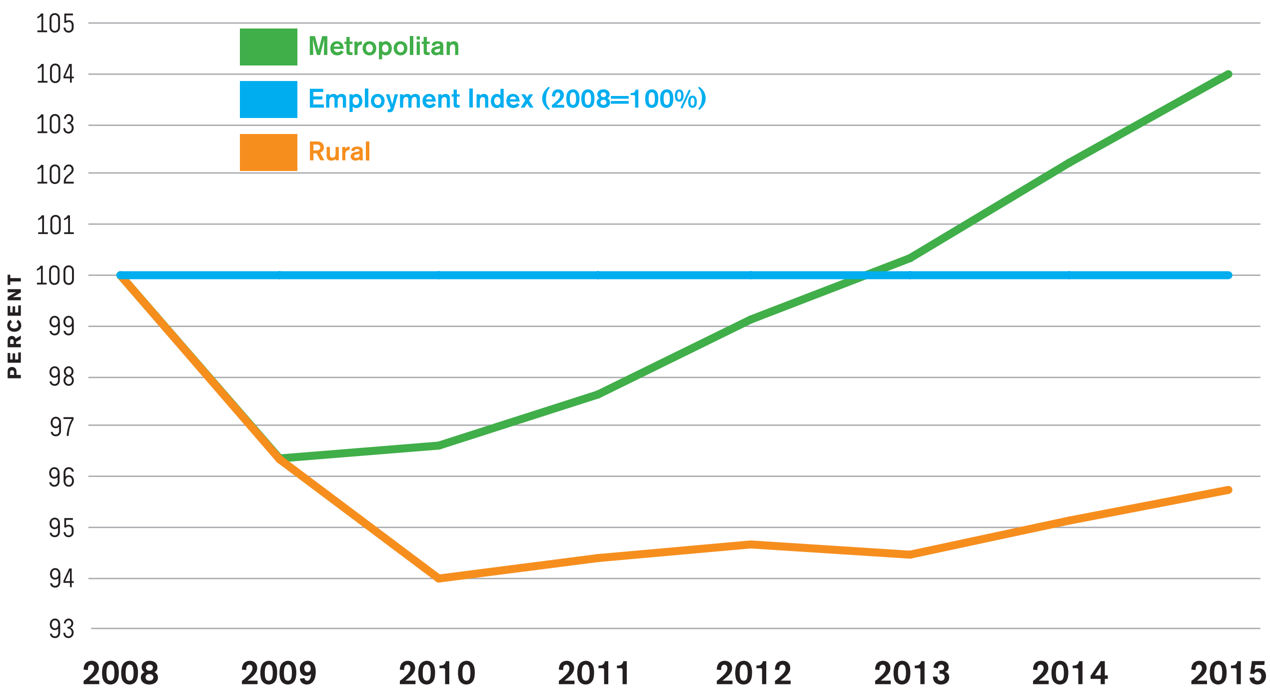
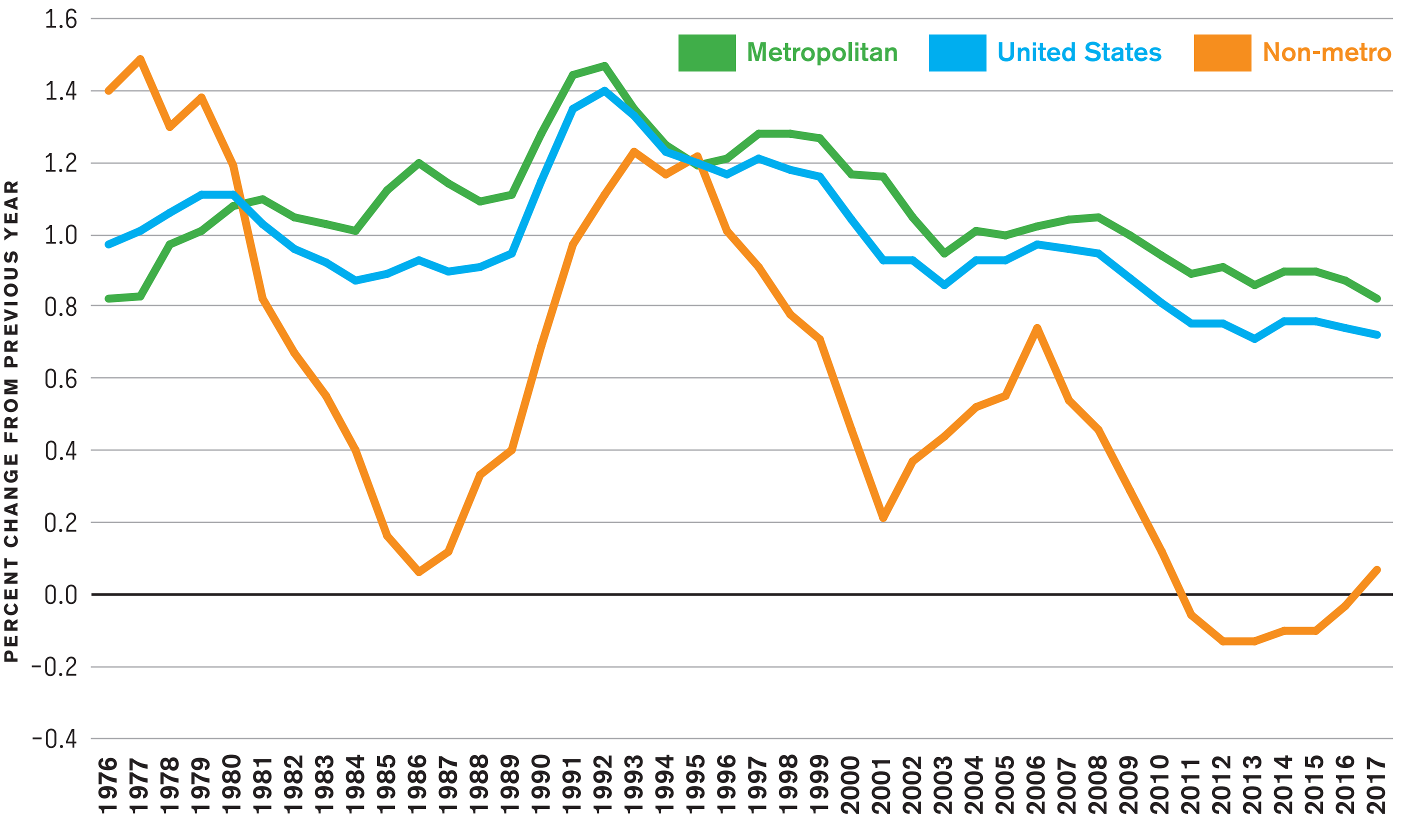


**Figure 5. Population Change by Metro/Non-Metro Status, 1976-2016**

Adapted from: Rural America is Losing Young People–Consequences and Solutions. Wharton Public Policy Initiative. March 2018.

Data source: USDA, Economic Research Service using data from U.S. Census Bureau.

Note: Metro status changed for some counties in 1980, 1990, 2000 and 2010.




Internet download speeds vary significantly across the United States and according to a report by the Federal Communications Commission (FCC), approximately 26 percent of rural residents do not have access to minimum broadband speeds[4]—a necessity when thinking about health services.

COVID-19 has also stressed local economies with small businesses have felt the impacts of shuttering their doors, and face an uncertain future. In agricultural sectors, the need to meet food supply requirements across the United States and in global markets while cooperating with state public health guidance and strained supply chains is creating tremendous strain.[5]

Additionally, there remains uncertainty regarding the extent to which urban workers will move to suburbs and rural areas due to recent economic disruptions. As teleworking options show signs of sustained productivity, the cost of living and proximity to potential infectious areas has workers reconsidering geographic location as a necessity for job prosperity.[6] With businesses and governments making the case for sustained teleworking, the geography of the workforce may shift to locations where cost of living and work-life balance are more appealing.[7,8]

4 The US has the 8th fastest internet speed in the world, but many are still left behind. AllConnect, March 2020.

5 Rural America Risks Letting Down Its Guard Just as Coronavirus Is About to Hit. Time. May 5, 2020.

6 Moving Out and Not Coming Back. National Review. April 23, 2020.

7 CFOs looking to make remote work, telecommuting more permanent following COVID-19, says Gartner survey. ZDNet. April 6, 2020.

8 Coronavirus Roundup: A Case That Telework Has Made Some Feds More Productive During the Pandemic.

**Potential questions for the Working Group to consider:**

- What will be the lessons learned from the COVID-19 pandemic be regarding the urban-rural divide? How can those be leveraged into opportunities bring prosperity across the nation?
- How can access to healthcare improve across remote and rural communities? In what ways can this facilitate greater economic opportunities?
- Aside from broadband, are there other infrastructure needs to bridge the urban-rural divide? Will these improvements enhance productivity or provide platforms for entrepreneurial activities?
- What is the role of government—local, state and federal—in bridging the urban-rural guide? Do education systems and universities have a role? What should those roles be?
- How can regions of the country that have shortfalls in healthcare and infrastructure capacity become innovation hubs? What elements are needed to spur innovation and prosperity in these areas?
- Will a migration of urban workers have a significant impact on productivity—positive or negative? How will urban centers respond to the movement of the workforce to a digital environment?

**Work with machines.** Robots and increased use of automation are likely to become commonplace, working in homes and offices, assisting in hospitals and classrooms, helping run farms and caring for the elderly. Autonomous systems will operate across factories, smart cities and infrastructure. Artificial intelligence is likely to affect portions of almost all jobs, changing the tasks performed, the way work is organized, the decisions made and the problems solved. Artificial intelligence could also change the size and mix of human capital and skills needed in an organization. Different sectors will need varying levels of education, training and re-skilling depending on current and projected skill requirements.

## Scaling Robotics in the Workplace

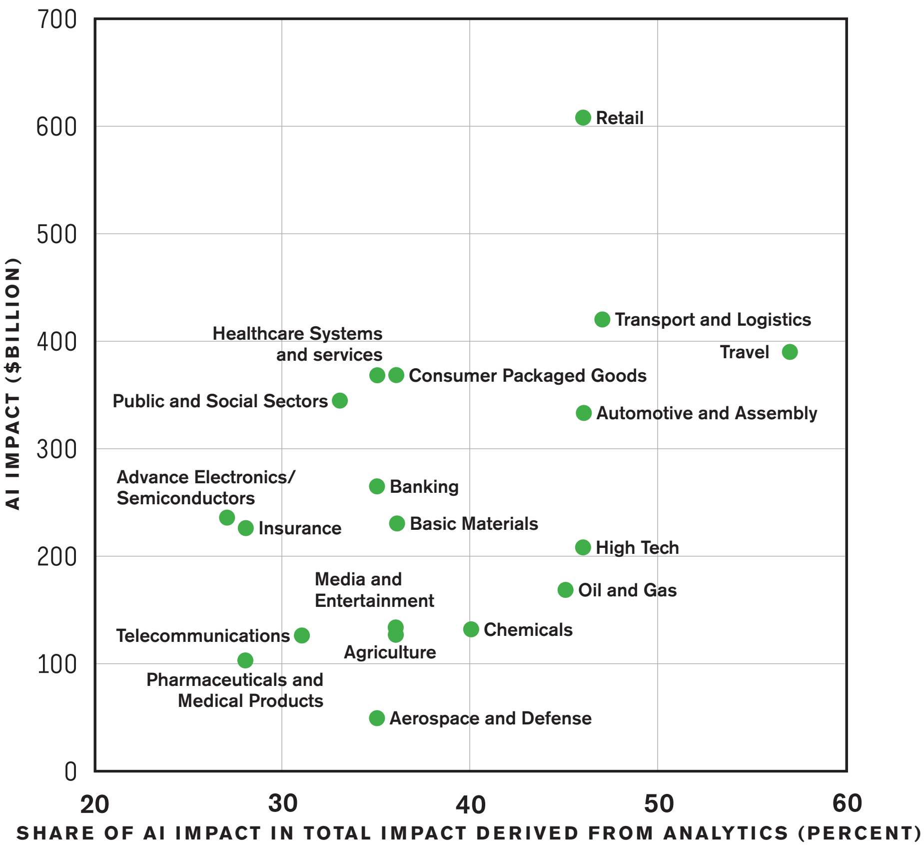
Today, Amazon has 200,000 robots working in distribution facilities, making it possible to store 40 percent more inventory, and easier to fulfill orders. The company states it has added more than 300,000 jobs since the introduction of robots in 2012, including positions in IT and in servicing and maintaining robots. Robots work in 1,500 Walmart stores cleaning floors and checking inventory. Given Walmart's national footprint, millions of people will get their first close look and engagement with robots at work.

In the coming world of collaboration between humans, robots and intelligent systems—and as enterprises integrate extended (virtual, augmented and mixed) reality into operations—there could be a fundament re-imagining of how work gets done.

For example, with extended reality, performing complex tasks remotely and focusing expertise around complicated problems and tasks are training opportunities for workers at different skill levels. In some, more medium-tech industries, these tools could also be used to fulfill tasks without advanced training,

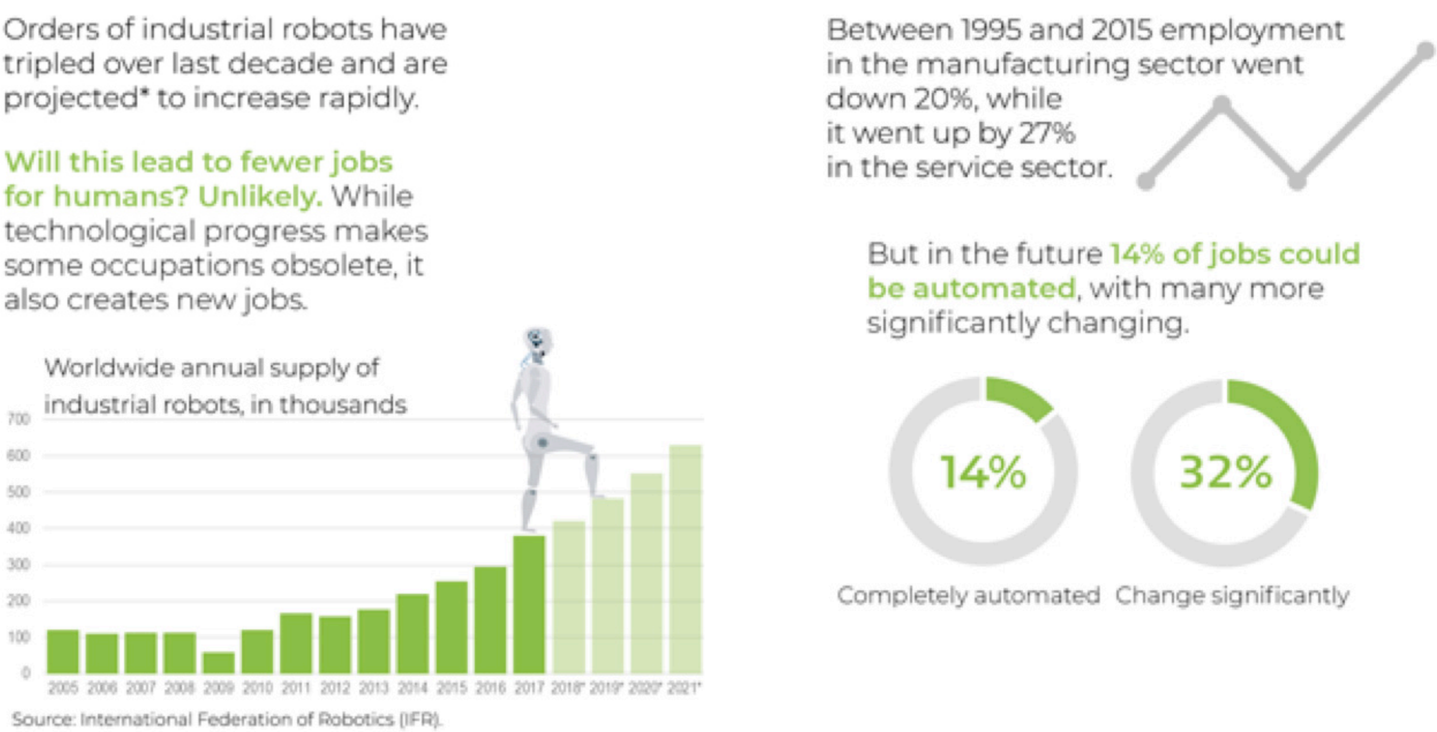
### Figure 6. Artificial Intelligence (AI) Has the Potential to Create Value Across Sectors

Source: AI, automation, and the future of work: Ten things to solve for. McKinsey Global Institute. June 1, 2018.




### Figure 7. Technology and the Future of Work

Source: [Data on the Future of Work. Organisation for Economic Co-operation and Development.]



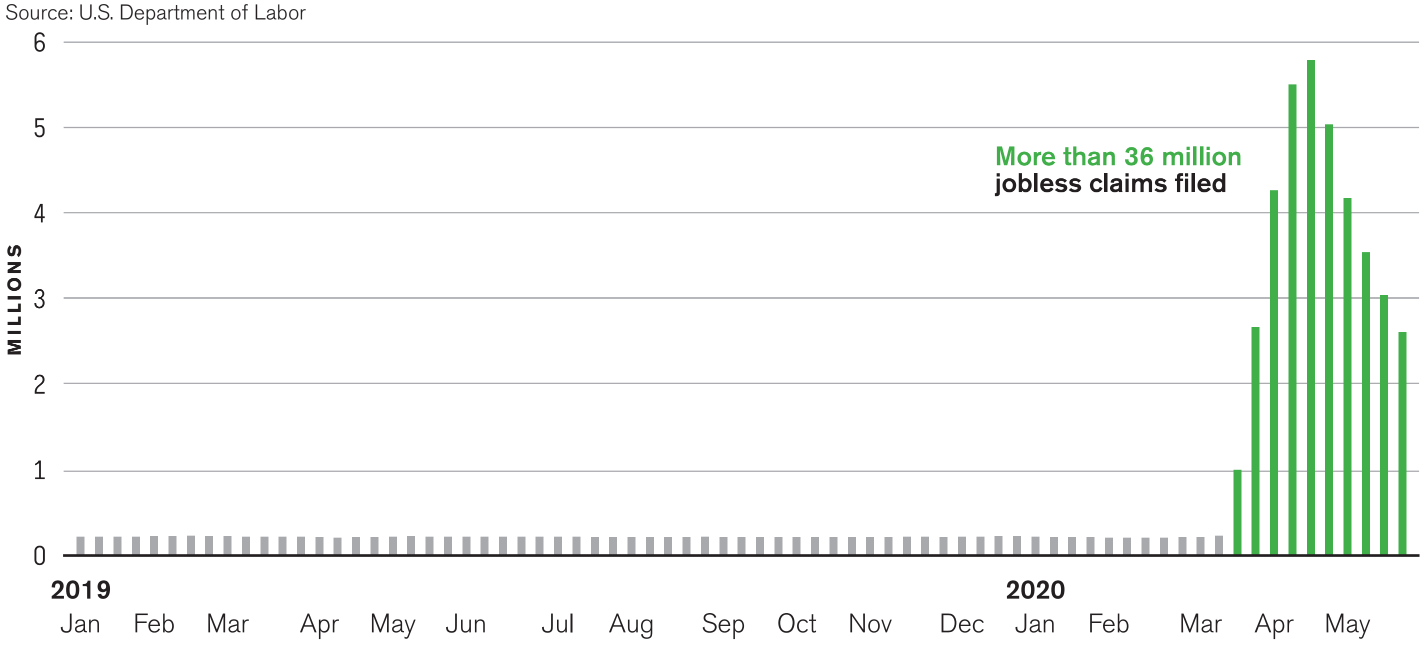
while high-tech, engineering-heavy and automated industries that require staff with controlling and computer skills may require significant training efforts. In general, qualification portfolios are likely to diversify, but a baseline of technical knowledge and skill will become a necessity.

**Potential questions for the Working Group to consider:**

- Do we need a new multidisciplinary field of work in engineering—the convergence of automation, cognitive and behavioral science, data analytics, organizational development, job design, systems integration, etc.?
- What skills will be needed to maintain and update the hardware and software for robotics and advanced machines?
- As machines increasingly perform routine work, does the public have a grasp on the potentially sharp upward trajectory of the economy's knowledge and skill requirements? What role must policymakers play in educating and supporting this shift?
- How will new machine-enabled work change daily lives and the patterns of work and society?

**New forms of work organization.** The impacts of the COVID-19 pandemic are bringing about significant changes to the U.S. workforce. The United States has reached more than 38 million individuals filing for unemployment with those in the service, hospitality and manufacturing hit hardest.[9] The U.S. Department of Treasury delivered over $48 billion to unemployment programs in April 2020.[10] An uncertain economic future provides additional challenge as well as opportunities for the future of work.

**Figure 8. Initial Jobless Claims by Week (Seasonally Adjusted)**
Adapted from: 'Rolling Shock' as Job Losses Mount Even With Reopenings. *The New York Times*. May 14th, 2020.
Source: U.S. Department of Labor




9 Analysis: These 10 States Have Seen the Highest Share of their Workforce File for Unemployment Amid COVID-19. US Chamber of Commerce. May 14th, 2020.

10 Daily Treasury Report. April 30th, 2020.


Source: CDC

As states and communities begin to reopen, recovery in those hardest hit sectors will not occur swiftly. Employee concerns remain over when and how to return to the workplace. Health, safety and workforce benefits are top issues, even as social distancing and more rigorous sanitation standards are set. Employers, particularly small businesses, are also worried about additional liability claims in this new environment.[11]

In the near term, even as the economy gradually opens, the businesses that had traditionally thrived on in-person engagements will continue to face challenges as health and safety issues will continue to influence social and fiscal behaviors.

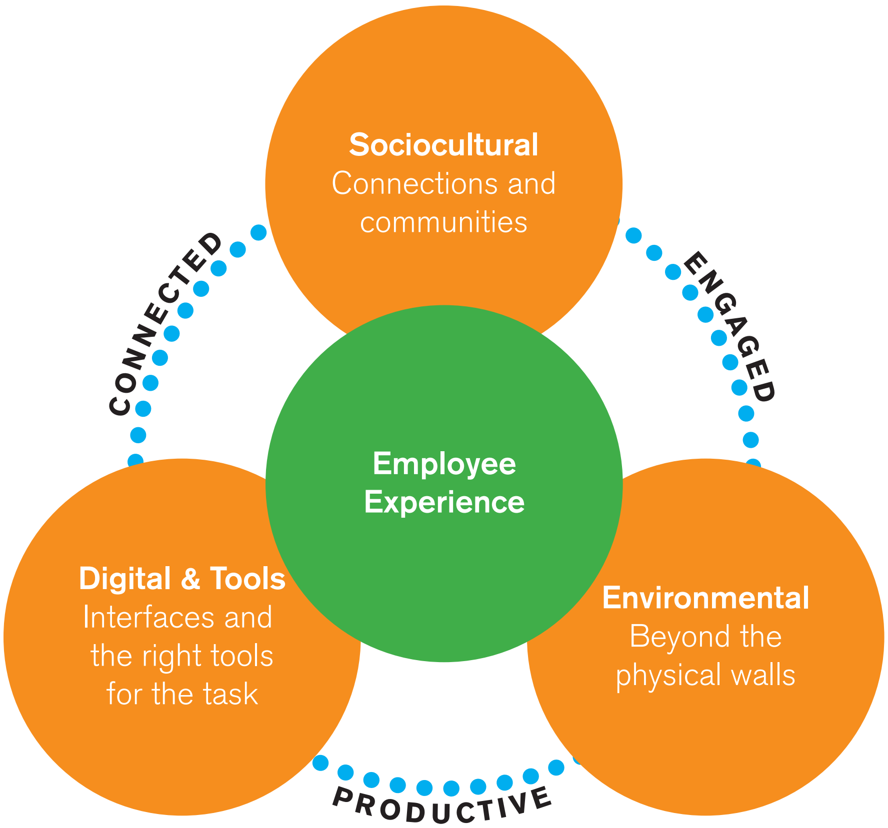
These issues have reintroduced and reinvigorated discussions of resiliency in the workplace. Organizational models will be faced with addressing these matters or be forced to accept risk in recruiting, maintaining and growing the workforce. The workplace will require more options and flexibility to address current needs and maximize productivity. These questions have direct impacts on the ability of individuals and organizations to adapt, thrive and innovate.

Gallup published an analysis on May 15, 2020 in *Human Performance Journal* examining organizational performance during times of crises. Data collected from the mid-1990s through 2015 suggests that a key attribute of organizations surviving times of crisis is resilience. Gallup goes further and identifies five key resiliency tenets that differentiates business organizations through crisis:[12]

11 NFIB Issues Liability Protection Principles for America's Small Businesses. National Federation of Independent Business.

12 Is Your Culture Resilient Enough to Survive Coronavirus? Gallup. May 15, 2020.

**Figure 9. COVID-19 Is Changing the Nature of the Workplace**
Source: Workplace transformation in the wake of COVID-19. KPMG. 2020.




1. **Clear expectations.** During tough times, employees need managers who reset priorities, involve them in reestablishing their goals and constantly clarify their role relative to their coworkers.
2. **The right materials and equipment.** As work changes during a crisis, ongoing discussions about what resources employees need to get work done are important to minimize stress and improve performance.
3. **Opportunities for employees to do what they do best.** The ability to leverage one's strengths in a crisis is the difference between moving toward opportunity and falling victim to circumstances.
4. **Connection to the mission or purpose of the organization.** During a crisis, people need to see how they, and their work, fit into the bigger picture—how they can impact something significant and know their work matters.
5. **Coworkers committed to quality work.** There is no room for slack in a crisis. All team members must be dedicated to high-quality, efficient work. It is equally essential that teams within an organization rely on and respect one another's work.

New forms of work organization, as the Gallup analysis suggests, can learn lessons in resiliency from past events. While the post-COVID forms of work organization remain unclear, steps to bolster resiliency can be implemented across the workplace and workforce.

In times of crises in particular, resiliency and agility can provide fertile ground for opportunities to create and innovate. Building these mechanisms in organizations and individuals offers the psychological, cultural and economic pillars to build capacity for continuous problem solving and risk taking needed to find new solutions.[13]

The prominent model for accomplishing work has been employer-based and carried out in a full-time job that is task, time- (9-5 day), and place-based. Today's technologies enable other models for accomplishing work—such as telecommuting, working from remote locations and freelancing, as well as enabling more flexible work schedules and staffing—which can help achieve societal, environmental and economic benefits for both employers and workers. These models can help people integrate work more seamlessly into their personal lives—if juggling responsibilities for children, health issues or other activities—as well as access jobs outside of their geographic regions, a particularly important feature for those living in declining rural and industrial areas of the country, or those who cannot afford to live in job-rich, high cost-of-living locations. Time spent commuting can decline significantly, saving perhaps hours per week to devote to other productive and personal activities (additional benefits might also include a reduction in negative environmental impacts).

More flexible patterns of work allow employers to tap a wider range of workers with knowledge and skills that can contribute value to the organization or business, but may reside in distant locations, or who cannot or prefer not to work in a 9-5, full-time job on employer premises. Remote work can also enhance labor mobility by providing an opportunity for work for a partner or spouse of an employee or new hire that is relocating. With a more flexible workforce and flexible staffing, employers can scale workforce size and mix as needed.

The high smartphone penetration and new infrastructures like cloud computing and big data make it possible to match up a person with a very special skill in Alaska with another special skill in Indonesia to serve a customer with a very special need in Angola.

**David Nordfors**
CEO
i4j Innovation for Jobs

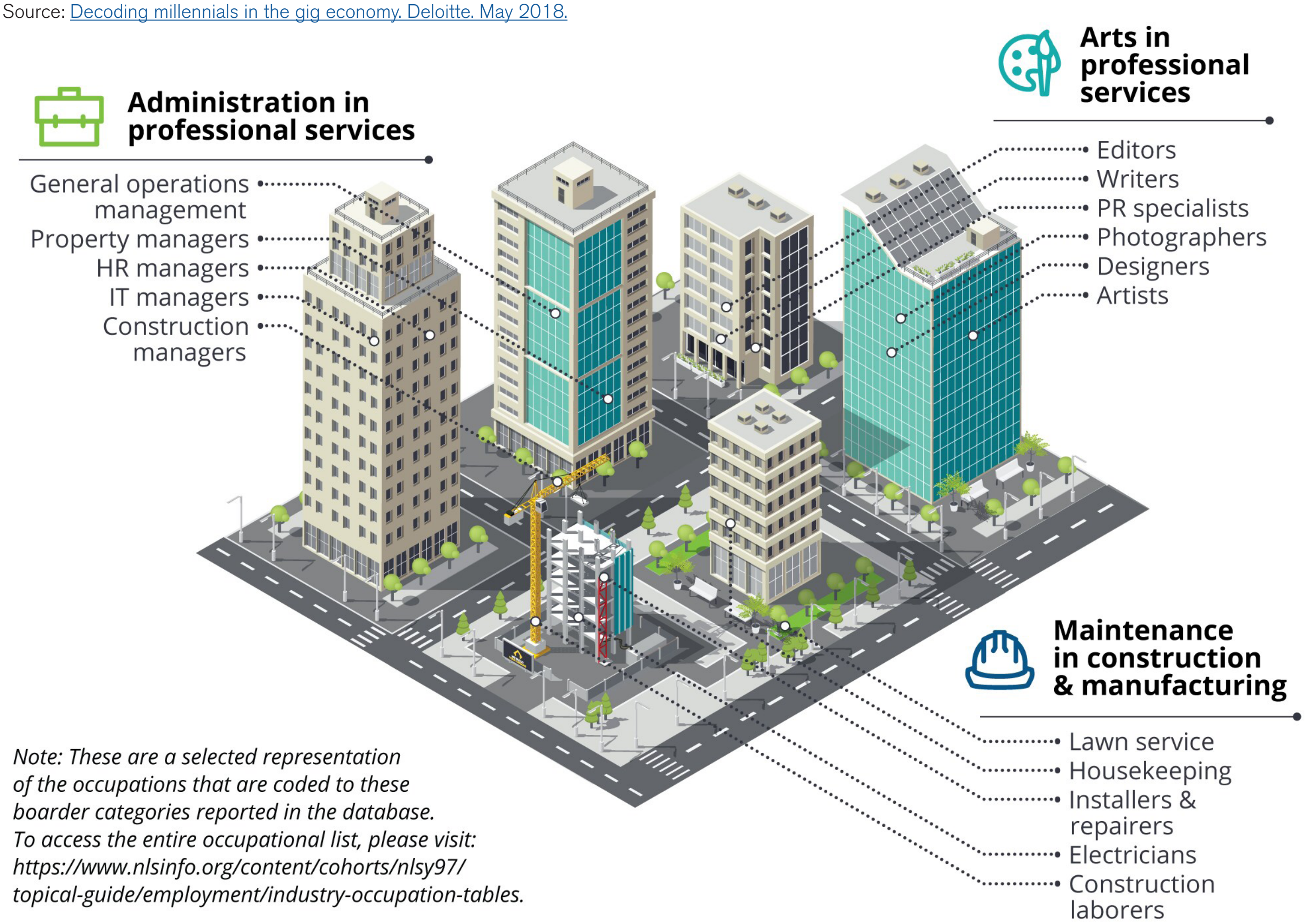
Uber and the Gig economy have established new models of worker independence. Digital technologies have made it easier to connect customers that need work performed with those able to perform it on a freelance basis.[14] While workers may face greater financial risk in the Gig economy, they may also engage in work of greater interest to them or make better use of their knowledge and skills in a place that may be more convenient, performed on a schedule of their choosing or more aligned with the demands of their lives.

The shift from more traditional, employer-based work to more decentralized, employee-based work also brings with it some operational challenges that were not relevant before: Health insurance and workers health and safety at the workplace were traditionally place-bound, meaning a work injury was defined by the place in which the injury occurred. With the change to less place-bound employment, such issues will pose new questions to insurances and health care providers when billing against individuals.

13 Social Innovation and Resilience: How One Enhances the Other. Stanford Social Innovation Review. Summer 2013.

14 Independent Work: Choice, Necessity, and the Gig Economy. McKinsey Global Institute. October 2016.

**Figure 10. Occupations that Alternate Workers Seek to Find Employment**
Source: Decoding millennials in the gig economy. Deloitte. May 2018.




New technologies could enable entirely new forms of people-centered, rather than employer-centered, and self-organized forms of work that optimize human capital and human capacity.[15] For example, today's digital technologies could be applied to identify markets of one or many around the globe, and search algorithms can match workers, goods and services with buyers, or workers around the world with each other, to form independent work teams that meet customer needs. Working on a global scale with five billion potential customers, a relatively small number of buyers can make a market. Service providers and innovators could facilitate marketing and matching for independent workers and forming of teams, helping them maximize their earnings.

**Potential questions for the Working Group to consider:**

- What are the opportunities for innovation given changing workforce dynamics? Can innovation and entrepreneurship succeed in teleworking and/or virtual environments?

15 The Future of Work is 5 Billion Customers Looking for a Good Job. TechCrunch.

- How can organizations ensure that resiliency reinforces innovative thinking and creation? How can the cycle of innovation be accelerated with organizations models learning from crises?
- What factors will influence the redesign of work?
- Are employers comfortable with workers working remotely and out of sight?
- How can we encourage employers to expand the geographic scope of recruiting, for example, to rural areas, distant areas and globally?
- What kind of ecosystem and infrastructure would be needed to support a people-based (vs. employer based) economy?
- What kinds of new knowledge, skills and support systems are needed for those working outside of traditional employer organizations?
- In what ways will this impact blue collar employees? Will the concept of collar status change in the future? Will this have a positive or negative impact to entrepreneurial ideas, people, organizations?
- What will be the impacts to healthcare: access to, costs and employee/employer obligations? And what will be the implications for more flexible employee models (part time employment, freelance)?
- What kinds of new regulations or policies are needed to address the challenges of worker protection, benefits and income security in a workforce of freelancers?
- What is needed in the area of taxation and labor laws to reduce barriers to cross-state remote work in the United States? What is needed in the area of pay, labor regulation and standards, and taxation for cross-border remote work?
- What incentives are needed for employers to allow more agile workplace accommodations?
- What kinds of new laws might be needed to protect workplace providers and those buying work or services from independent workers or temporary freelancing work teams, especially those that cross international borders? Who is liable for the work performed, and what happens when a team disbands?
- What is needed to scale new forms of work organization that are not employer centered?

**Equity.** While progress has been made over the last decades to achieve greater equity and equality across gender, racial and socioeconomic demographics, significant challenges remain to achieve widespread prosperity and optimize innovation and productivity.

There is no question that less equity, less diversity, and less inclusivity are detriments to the nation's overall ability to be innovative and create competitive advantage globally. Simply put, organizations that value and execute on the premise that recruitment, retention and promotion of employees across racial, gender, socioeconomic and sexual orientation leads to more innovation and the release of more products.[16]

While U.S. women exceed men in attaining bachelors degrees, they have not achieved parity in workforce participation, pay or career progression. The ratio of women's to men's median weekly earnings for full-time wage and salary workers in all occupations was 81.1 percent in 2017.[17]

The gap has narrowed, in part, because women are increasing their presence in higher paying occupations. Nevertheless, the earnings ratio is lower in some occupations, such as personal financial advisors, physicians and surgeons, real estate brokers, sales agents and chief executives. In the first quarter of 2020, the U.S. Bureau of Labor Statistics found that women had median weekly earnings of $857,

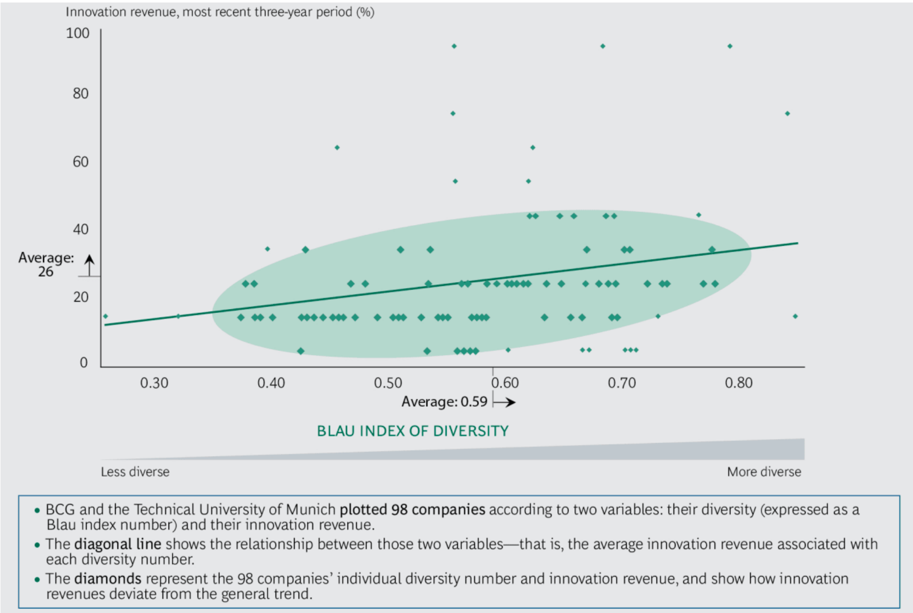
16 Diversity in business really does boost innovation, according to a new study. Fast Company. January 2018.

17 U.S. Department of Labor Women's Bureau.

**Figure 11. The Relationship Between Diversity and Innovation is Positive and Statistically Significant**

Adapted from: The Mix That Matters. BCG. April 26, 2017.

Data source: 2016 survey of German, Swiss and Austrian companies by BCG and Technical University of Munich. Ninety-eight of the surveyed companies provided the necessary information for this analysis.



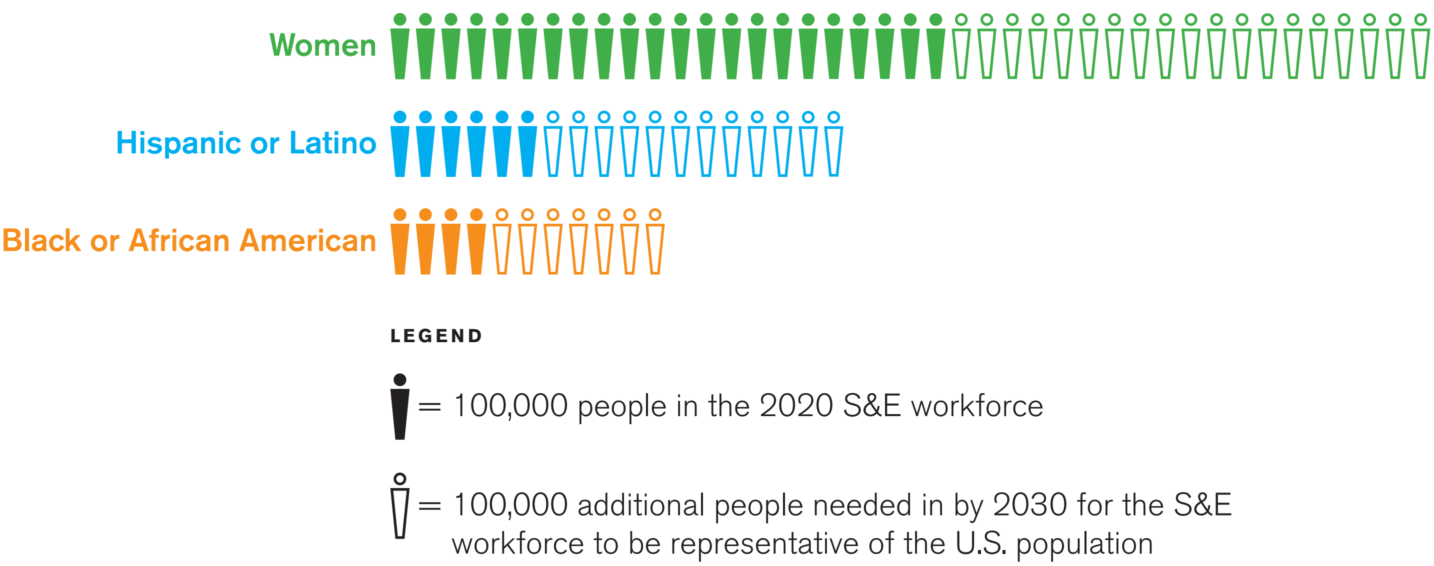

The shown relationship is positive (Pearson's r=0.253) and statistically significant ($p<0.05$).

Innovation revenue = the percentage of revenue from new products or services in the most recent three-year period.

**Figure 12. Missing Millions: Faster Progress in Increasing Diversity Needed to Reduce Significant Talent Gap**

Source: National Science Board Vision 2030

While the number of people from under-represented groups in the S&E workforce has grown over the past decade, much faster increases will be needed for the S&E workforce to be representative of the U.S. population in 2030. To achieve that goal, the NSB estimates that the number of women must nearly double, Black or African Americans must more than double, and Hispanic or Latinos must triple the number that are in the 2020 U.S. S&E workforce. These estimates are based on projections from the U.S. Census and Bureau of Labor Statistics, together with data from the National Center for Science and Engineering Statistics, and assume that participation of these groups in the S&E workforce increases at current rates.



or 80.4 percent of men's earnings.[18] Majorities of Americans see men and women as equally capable in terms of qualities for leadership. Yet, only 4.8 percent of CEOs in the Fortune 500 are women, and only 22 percent of Fortune 500 board members. Women leaders are more prominent—though still a significant minority—in academia, with 30 percent of universities having women presidents in 2016.[19] In addition, women's rate of workforce participation has leveled off at 57 percent, compared to men at 69 percent, in 2017.[20]

Inflexible career paths that don't allow for a smooth dual-engagement in career and family planning, occupational selection, hours worked and the industry of employment are some of the reasons for the persistent variations. For example, some higher paying jobs favor long hours and reward willingness to put work over other life activities. And despite the positive changes that have been made, working women are nearly twice as likely as men to say they have faced gender discrimination on the job, one in four working women say they have earned less than a man who was doing the same job, more than one in five say they have been treated as if they were not competent because of their gender. Financial factors—such as healthcare costs and the costs of raising children—along with career progression outlooks are causing more women to delay having a family until later in life.[21]

Equity issues are being further exacerbated during the COVID-19 pandemic as changing work dynamics—unemployment, layoffs, remote working—are pitted against family and personal life obligations.[22]

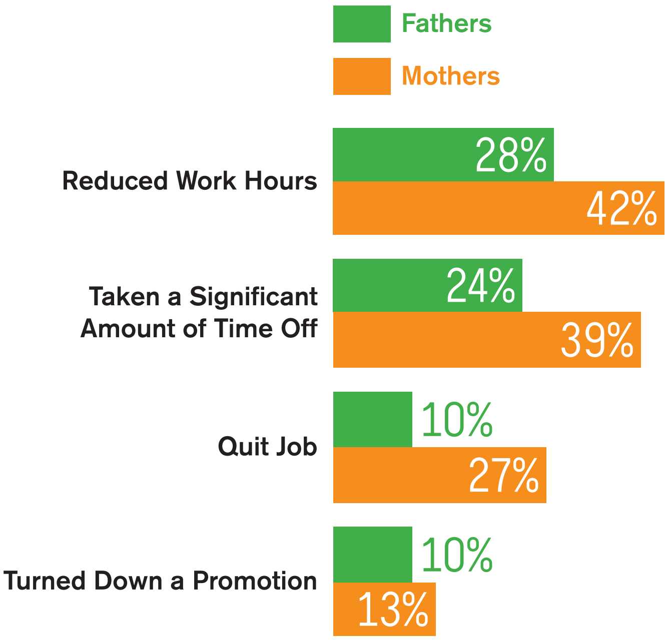
Similarly, some severe impediments remain for people of color, particularly for African Americans and Hispanics. Only 0.8 percent of executive jobs

**Figure 13. Mothers, More than Fathers, Experience Career Interruptions**

Adapted from: Despite progress, women still bear heavier load than men in balancing work and family. Pew Research Center. March 2015.
Source: Pew Research Center survey, Oct. 7-27, 2013, N=2,002.

Percent saying they have ___ in order to care for a child or family member.

Note: Based on those who have ever worked, "fathers" and "mothers" include those with children of any age, including adult children. (n=1,254).




in Fortune 500 companies are held by African Americans,[23] and only 4 percent of executives are Hispanic.[24]

This persistent inequality across racial divides is rooted to no small degree in educational access. Less than 8 percent of Ivy League graduates are African American. As we prepare for the high-demand jobs of the future, African Americans and Hispanics account for only about 6 and 10 percent, respectively, in engineering programs across the

18 U.S. Bureau of Labor Statistics: The Economics Daily. April 21, 2020.

19 The Data on Women Leaders. Pew Research Center. September 13, 2018.

20 Bureau of Labor Statistics, U.S. Department of Labor.

21 New Study: Millennial Women Are Delaying Having Children Due To Their Careers. Forbes. May 1, 2020.

22 New work-life reality raises equity and inclusion concerns, says Stanford sociologist. Stanford News. April 30, 2020.

23 Why so many black business professionals are missing from the C-suite. CBC News. December 2019.

24 The Latino Leadership Shortage. Korn Ferry 2017.

nation.[25] Diversity in the workforce has a direct link to innovation and determining a competitive advantage in organizations.[26] Increasing representation in education pipelines encourages diverse perspectives which are known to fuel the creative elements needed for innovation and growth.[27]

Simultaneously, jobs that have traditionally allowed for upward mobility into the middle class, especially for people of color, such as clerical work, health professionals and other middle-wage jobs in forestry, agriculture, fisheries, and metal and machinery trades are increasingly being automated.[28]

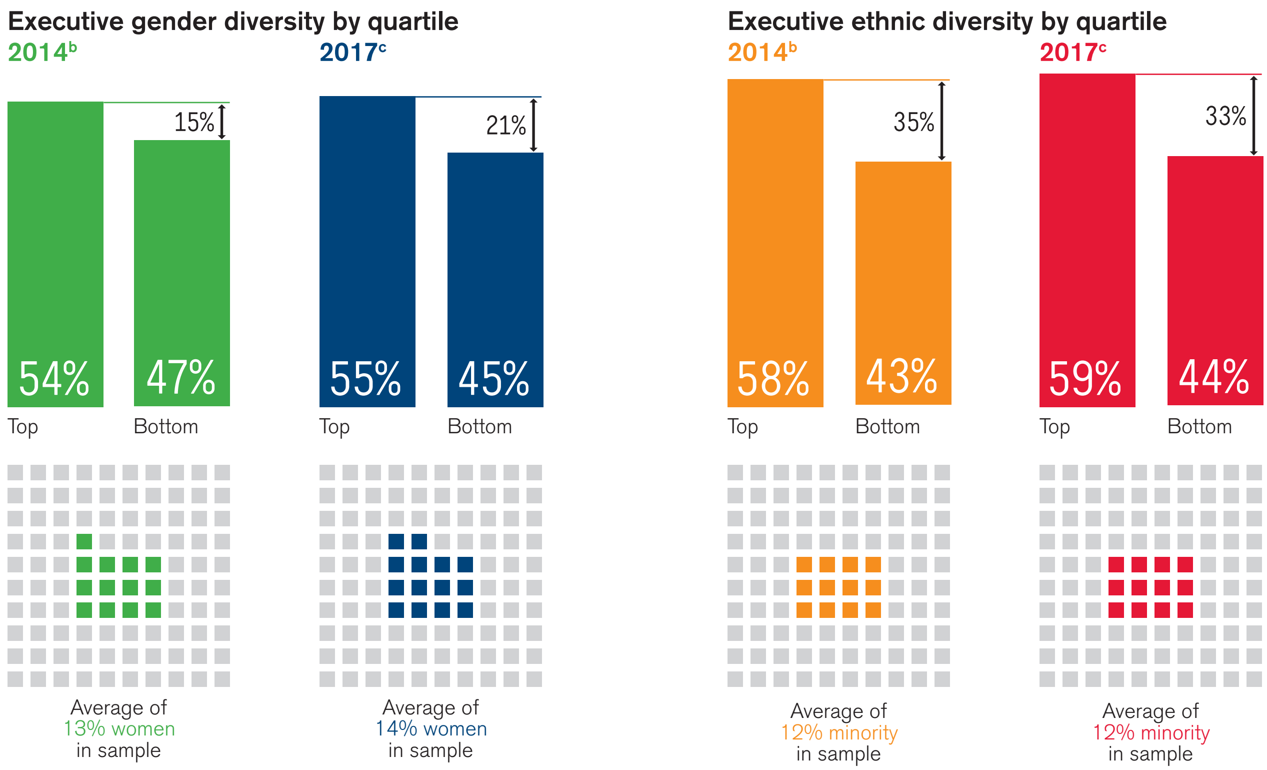
Where access to prestigious higher education is a selector (such as most executive jobs in Fortune 500 companies), it is therefore not surprising that there remains a racial divide across the United States.

**Figure 14. Gender and Ethnic Diversity are Clearly Correlated with Profitability, but Women and Minorities Remain Underrepresented**

Adapted from: [More Evidence That Company Diversity Leads to Better Profits. Forbes. January 2018.]

Data source: McKinsey & Company

**Likelihood of financial performance[a] above national industry median (percent)**




a. Average earnings-before-interest-and-taxes (EBIT) margin, 2010-2013 in Diversity Matters I and 2011-2015 in Diversity Matters II.

b. Results are statistically significant at p-value <0.10.

c. Results are statistically significant at p-value <0.05.

25 The Demographics of the Ivy League. The College Monk. April 2020.

26 Why Diversity And Inclusion Matters – From An Innovation Perspective. Digitalist Magazine. August 22, 2018.

27 Diversity Confirmed To Boost Innovation And Financial Results. Forbes. January 15, 2020.

28 The robots are coming. Let's help the middle class get ready. The Brookings Institution. December 2018.

When the supply of human capital is skewed, even measures like affirmative action and quotas cannot come into effect to ensure higher standards of equality and equity. Achieving greater equity should allow for a greater talent pool and increase in human capital to boost productivity gains and economic growth.

**Potential questions for the Working Group to consider:**

- Employers have taken steps to support women and workers with children in their workforces, including onsite daycare, family friendly leave policies, more flexible work schedules, etc. What more can be done to encourage greater flexibility for families in order to retain and promote talent?
- Can telecommuting and remote work be expanded to increase participation in the workforce and the organization for women, caretakers or other members of society with family obligations? Does working off-site reduce women's ability to build company-specific skills and social capital within the organization that helps underpin their advancement?
- Is national legislation needed, for example, to mandate paid family leave or equal representation on boards of directors?
- Should even greater effort be made to attract women and minorities to prepare to enter higher paid careers such as those in engineering, computer or financial occupations?
- How can representation across sectors increase?
- What can be done in the education pipelines to foster inclusion and opportunities?
- What can we do to ensure greater upward mobility through education and employment in light of many such occupations facing a high risk of automation?
- How do we democratize higher education, creating an education and training system that is inclusive regardless of current education and skills, age, income, work status, time for learning, etc.? How do we get universities to treat students as customers looking to buy knowledge and skills, and to compete to provide those?
- What can be done to increase the number of underrepresented groups in execution positions and boards?

**Worker Flexibility.**

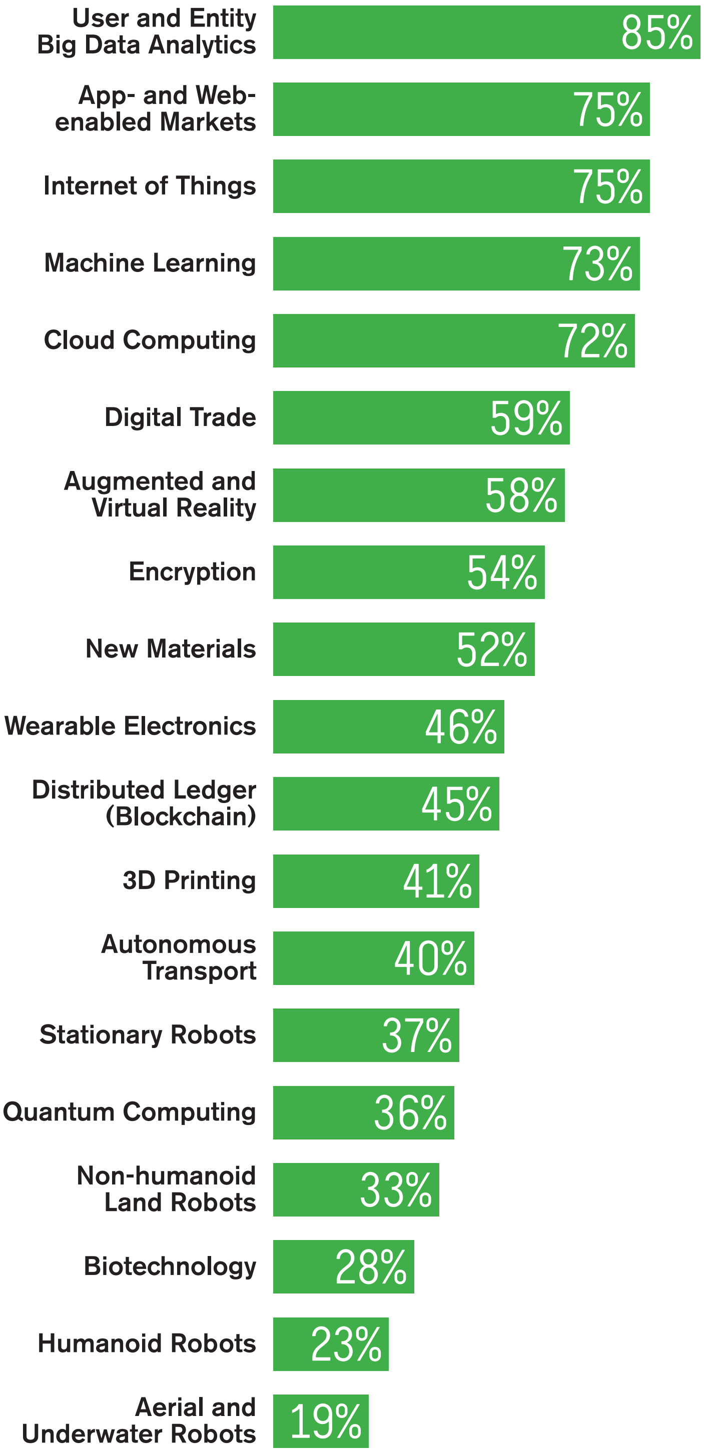
**Potential questions for the Working Group to consider:**

- Is industry adequately engaged in giving direction to education and training institutions in terms of the knowledge and skills employers need? What are the best mechanisms for achieving that exchange of information? Are universities listening?
- How can the United States leverage the existing urban and rural communities to harness the local talent and capabilities to accelerate entrepreneurship and productivity? What kinds of investments are needed to grow innovation hubs?
- Is the U.S. education system preparing U.S. students and workers for the advanced economy ahead, (when AI and other automation perform routine tasks), and with the ability to respond to frequent disruptions in the labor market?
- Do we need to reevaluate the baseline of what people need to know and be able to do? And how do we balance the new baseline—the rise of multidisciplinarity in business and innovation—with the need for specialization? Is higher education structured to address these new needs?

**Figure 15. Technologies by Proportion of Companies Likely to Adopt them by 2022 (Projected)**

Adapted from: [The digital skills gap is widening fast. Here's how to bridge it. World Economic Forum. March 2019.]

Data source: Future of Jobs Survey 2018, World Economic Forum.




- What levers do we have to reduce the cost and improve the productivity of higher education? How do we change the cost structure? What is standing in the way of transformation in education?
- How do we incentivize universities to link their teaching with the needs of the economy and labor market to provide career- and life-relevant curricular experiences and credentials?
- The U.S. science and engineering workforce is aging, which could have important implications for the supply of science, engineering and technological expertise in the economy.[29] The number of science and engineering degree holders in the United States far exceeds those working in science and engineering jobs. What could draw these professionals back into innovation and to replace those aging out of the workforce?

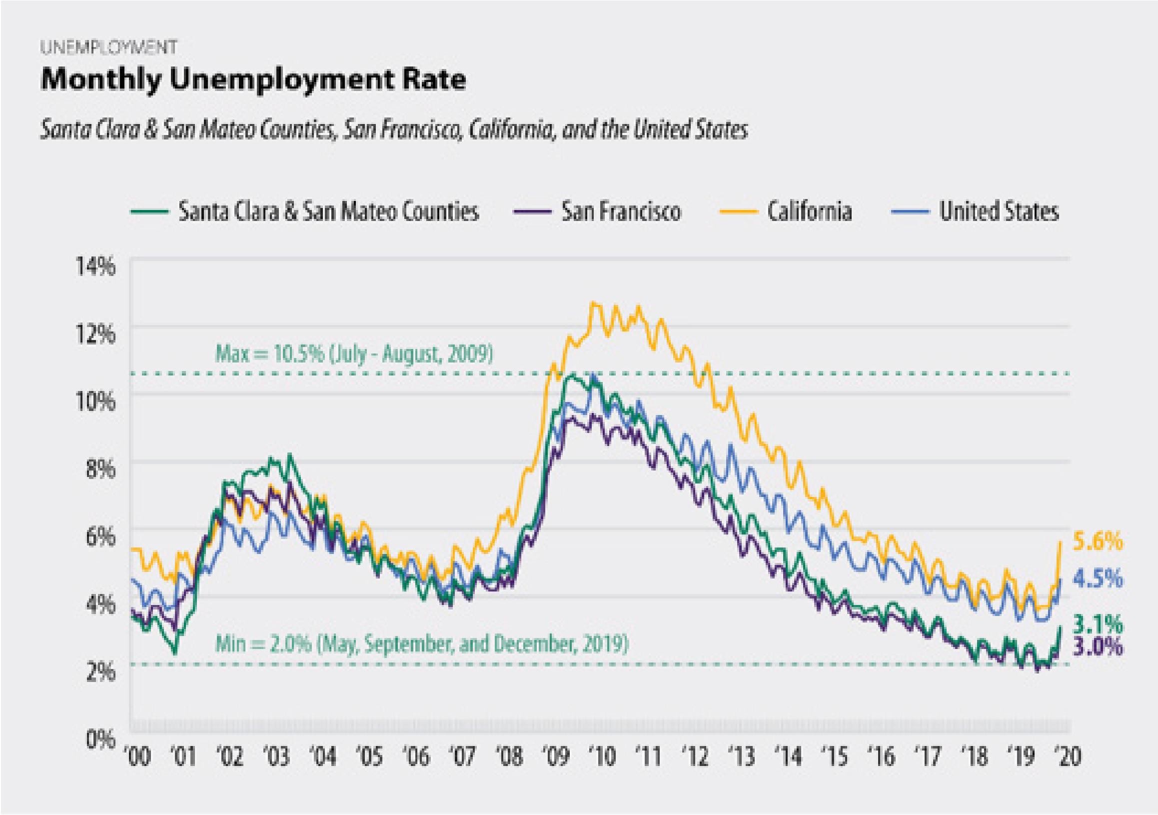
**Strengthening U.S. entrepreneurial and start-up punch.** Entrepreneurs and start-ups play a vital role in leveraging new knowledge and technology to create and grow new businesses and, those that grow into large and successful firms can transform entire industries. As noted in the Council's preeminent work on regional innovation ecosystems, U.S. regions can no longer primarily compete based on their natural resource endowment, low cost labor, or tax incentives. Instead, regional prosperity depends upon a region's capacity to support innovative firms, institutions, entrepreneurship and people. Currently, the nation faces obstacles as the COVID-19 pandemic has shifted entrepreneurial portfolios and changed business models in certain sectors.

29 The aging of the science and engineering labor force is reflected in the median age, which has risen from 40 years in 1993 to 43 years in 2015; the median age nationally for the U.S. population was 34 years in 1993 and 38 years in 2015. Another indicator, the percentage of individuals in the science and engineering labor force between 51 and 75 years of age, has risen from about 20% in 1993 to 33% in 2015; Science and Engineering Indicators 2018, National Science Foundation.

**Figure 16. Monthly Unemployment Rate, Silicon Valley Comparison with California and United States**

Adapted from: Silicon Valley Unemployment Increased to 3.1% in Earliest Response to COVID-19. Joint Venture Silicon Valley. April 17th, 2020.
Data source: Joint Venture Silicon Valley. April 17th, 2020.

Silicon Valley unemployment increased to 3.1 percent in earliest response to COVID-19.




Health care startups have seen increased funding to address testing, data access, data analytics, supply chains and 3D printing for medical devices.[30] Larger, more established technology firms have also prioritized COVID-19 response as part of their business plans. In March 2020, companies such as Facebook, Microsoft, Twitter and Slack joined forces with the World Health Organization (WHO) for a COVID-19 hackathon seeking software solutions.[31]

While certain firms are finding opportunities in healthcare and data services, start-ups overall are facing decreased funding. Additionally unemployment is rising in the start-up community. Data from the California Employment Development Department (EDD) shows rising unemployment in Silicon Valley with unclear forecasts in the coming months and years.

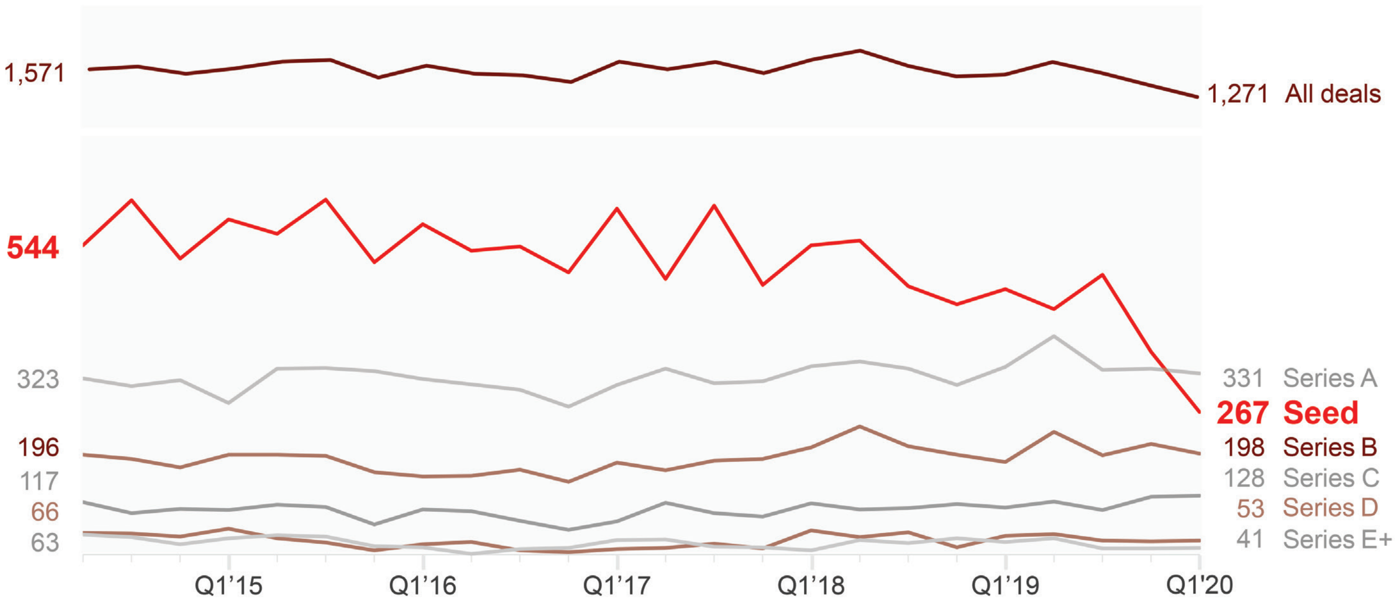
Nationwide, venture capital and seed funding saw a decline in Q1 2020. Estimates since March 2020 found that approximately 300 U.S. startups have laid off about 30,000 employees across the country.[32]

30 You can now get a free coronavirus assessment online, thanks to telehealth companies. Fast Company. March 11, 2020.

31 Facebook, Slack and Twitter among tech companies joining WHO to launch COVID-19 hackathon. Techrepublic. March 30, 2020.

32 Startup Ecosystem Faces Capital Crunch over Coming Months. National Venture Capital Association. April 27, 2020.

**Figure 17. Seed Deals See Steep Decline in Q1 2020, Deal Activity by Round**
Source: PwC/CB Insights Money Tree™ Report Q1 2020.




With layoffs and unemployment in Silicon Valley, other cities and mid-market areas of the country see opportunity in attracting technology talent and future funding. Regional economies with close ties to universities, supply chain and manufacturing access, and lower labor rates are vying for potential growth.[33]

The process of finding creative ways to combine new technologies and processes, and make novel products and services, leads to the start-up of businesses and the decline of less productive businesses or those whose business lines are made obsolete which is accelerated by stay-at-home orders and the closing of the U.S. economy in recent months. This churning of firms—one way the economy reorganizes around disruptive technologies—helps revitalize the economy, reallocating resources from less profitable businesses to more profitable and competitive ones.

Looking back, U.S. start-up and entrepreneurial punch weakened in the years surrounding the Great Recession, and had been recovering, but the impact of COVID-19 has altered future projections. Also, based on the filing of business applications, business start-ups have seen a dramatic decrease in 2020.[34]

U.S. universities and federal laboratories are increasingly supportive of entrepreneurs and start-ups seeking to spin out and to develop and scale new technologies and businesses. However, entrepreneurs and small firms often lack funding to develop prototypes, and to validate and scale their innovations. Lacking adequate resources at this critical juncture in the innovative life-cycle, these technologies may fall into the "valley of death," stalling or terminating their development and commercialization and increasing their vulnerability to foreign acquisition. Other challenges include: the risk and challenge of establishing a venture; validation of the business in the marketplace; and finding the right talent and skill sets needed as the business is founded, responds to market developments and matures.

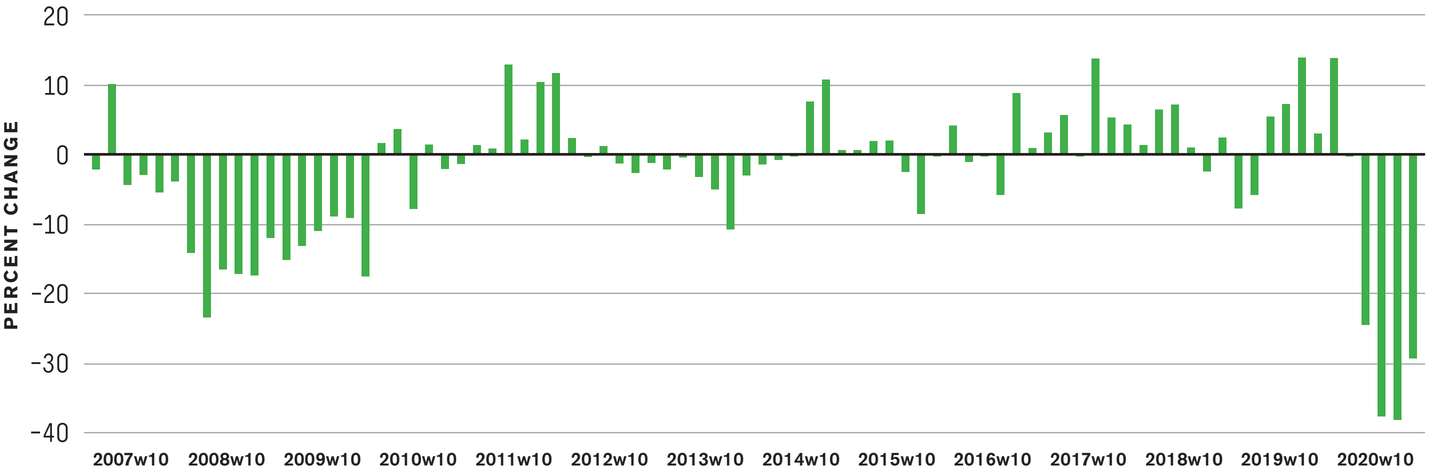
33 COVID-19's cost to Silicon Valley could be Kansas City's talent gain, startup leader predicts. Startland News. May 12, 2020.

34 New Data Foreshadow COVID-19's Impact on Business Formation and Entrepreneurship. Economic Innovation Group. April 17, 2020.

**Figure 18. Year Over Year Percentage Change in New Business Applications from High Propensity Businesses for Reference Weeks 10-15, 2007-2020**

Adapted from: Esposito, N and Fikri, K. "New Data Foreshadow COVID-19's Impact on Business Formation and Entrepreneurship." Economic Innovation Group. https://eig.org/news/new-data-foreshadow-covid-19s-impact-on-business-formation-and-entrepreneurship.
Source: U.S. Census Bureau Business Formation Statistics.

Note: Businesses with anticipated hires are defined as "high propensity with planned wages" by the Census Bureau.




In response, ecosystems in support of small innovators are growing around research universities and in U.S. metro areas—work spaces, networks, training and events. Because these dynamic young firms play a key role in driving regional economic development, many state and regional governments have programs in place to nurture entrepreneurs and start-ups, including seed and venture funds, incubators and accelerators. Some companies are nurturing new start-ups, and reaching out to access their technologies. What the long term impact of the COVID-19 crisis will be on these programs remains to be seen.

Even during these difficult times, the United States has tremendous entrepreneurial potential. The COVID-19 pandemic has spurred Individual and collaborative responses from technology firms, universities and government entities. Emphasis areas for potential economic growth are now focused on healthcare, biotechnology, data analytics and digital infrastructures at scale.[35] Among the U.S. adult population, 70 percent see good opportunities to start a firm in the area where they live (compared to a 46 percent global average), and 56 percent believe they have the required knowledge and skill to start a business.[36]

Entrepreneurs in the United States are driven by the challenge of solving problems, developing innovative solutions and continuously asking "what if?" In order to unleash the creative minds, environments and cultures that incentivize innovation, value risk and encourage learning from failure.[37] Innovation and opportunity are intrinsically tied to creating opportunities for increased entrepreneurial activities that will drive U.S. competitive advantage.

35 COVID-19 Will Fuel the Next Wave of Innovation. Entrepreneur Magazine. March 16, 2020.

36 GEM Global Entrepreneurship Monitor 2018.

37 Proceedings of the National Academy of Sciences. Risk attitudes and personality traits of entrepreneurs and venture team members. August 19, 2019.

**Potential questions for the Working Group to consider:**

- What is the state of the U.S. entrepreneurial economy?
- What can be done to reinvigorate and revitalize funding for start-ups and key technology growth area firms? How do we unleash entrepreneurial ingenuity and funding across the nation?
- What elements are needed for regions to successfully scale?
- How will regions innovate and compete if they do not have traditional innovation engines: a local research university, access to a good community college, proximity to a national lab or set of research institutions, etc.?
- What is the role of government—at the local, state and federal levels—in an entrepreneurial ecosystem?
- How do we create, facilitate and ensure a pipeline of innovators and entrepreneurs? What is the role of primary, secondary, and higher education?
- How do we ensure new enterprises have the support needed to be successful and innovative? What elements of the supporting ecosystem need strengthening?
- What are the most important policies in the United States for starting and growing a business, and especially a technology-based start-up? Which ones play the most positive role, and which are serving as barriers to success?
- There are numerous efforts across the country to nurture entrepreneurs and start-ups—connected to state and regional economic development, at universities, and operated by private companies. Is this ecosystem adequate? Can it be better integrated to provide more seamless support through the innovation life cycle?
- What are the critical elements of university programs that successfully spur entrepreneurs and spin-out startups?
- What more needed to be done to address the "valley of death"?
- How can we tap more of America's entrepreneurial potential, encouraging more Americans to take the leap of starting a business?
- How do we ensure we capture the full entrepreneurial value of our human capital to drive innovation and prosperity? Is there a path to a fully inclusive entrepreneurship ecosystem?

**Council on Competitiveness**
900 17th Street, NW, Suite 700, Washington, D.C. 20006, T 202 682 4292
Compete.org

Compete.

Council on Competitiveness