Ensuring the Continued Functionality of Essential Critical Infrastructure Industries by Estimating the Workforce Impacts of COVID-19

This economic impact assessment was compiled on April 9, 2020 for the Colorado Food Supply Task Force by Jude Bayham and Alexandra E. Hill. More information about the authors can be found at the end of the document. Last updated April 9, 2020.

Bottom Line

While many workers have been sent home amid the COVID-19 pandemic, those in our critical infrastructure industries are more essential than ever. In particular, it is vital that workers involved in the production and distribution of food continue to work to ensure ample food for our population. Here we outline three major concerns that might influence the ability of workers in these industries to continue showing up to work: new childcare obligations amid school closures, pre-existing conditions that put workers at-risk for developing complications if they contract COVID-19, and loss of wages if unable to work. We estimate that nearly 200,000 children in Colorado will require at-home parental supervision and have parents employed in essential critical infrastructure industries; 8,000 of these children have parents in essential food systems industries. We estimate that 157,000 Colorado workers in essential critical businesses are over 60 and have a pre-existing health condition, putting them at high risk of developing complications if they contract COVID-19, and 38,000 of these workers are in food systems industries. We estimate that at risk workers in Colorado's essential critical industries have average weekly earnings of $1,137 and those within the food system have earnings of nearly $1,490.

Policy Recommendations

- *Offer safe childcare options for workers in essential industries:* Workers in these industries might be unable to work if they need to be home with their children. Providing childcare options for these workers and their families will help essential businesses maintain the workforce necessary to operate.
- *Consider the number of at-risk workers when allocating financial and medical resources to counties:* Our county and industry estimates of the number of workers with pre-existing health conditions and those who are older should be used to ensure each county is prepared and able to provide the care necessary for workers who develop complications.
- *Ensure that all workers in critical infrastructure industries have pay for sick leave:* COVID-19 will be more likely to spread among workers if those who fall ill continue to work. Efforts to preserve worker incomes should be extended to all workers in critical infrastructure industries to reduce the likelihood of this occurring.

Context

The response to the COVID-19 outbreak has created substantial disruptions in the state and national economies. The mandatory distancing policies have led to a rise in layoffs, which will have implications throughout the food system including the ability to purchase nutritious food. At the same time, food provision, distribution, and retail have been designated 'essential critical businesses' by the federal and

state governments. As the outbreak continues, workers employed in these 'essential critical businesses' will experience elevated exposure to the virus and may need support with child care as schools and daycares remain closed.

We use the most recently available data from the US Current Population Survey (CPS, 2020), the Quarterly Census of Earnings and Wages (QCEW, 2018), and the National Health Interview Survey (NHIS, 2016-2018) to better understand the potential impacts of the outbreak for Colorado and the nation. In particular, we use data from the CPS to estimate child care obligations and shed light on the number of workers who may have new child care obligations as a result of school and day care closures. We separate this analysis for workers employed in critical infrastructure industries. Next, we combine data from the QCEW and NHIS to construct estimates of the number and percent of jobs that are likely to be filled by at-risk workers, again separating for critical infrastructure industries.

Childcare:

Childcare is an important issue for families with workers in essential industries. With schools and day cares closed, workers may face a difficult tradeoff: care for their children and risk losing their job, or pay for alternative childcare which may be expensive and increase risk of infection. We have already seen evidence of workers in essential critical businesses staying home due to childcare obligations. For example, a recent article in The Denver Post pointed out high absentee rates at a meat packing plant in Greeley following school closures (https://www.denverpost.com/2020/03/31/jbs-meat-plant-greeley-colorado-coronavirus/).

We estimate that there are about 800 thousand children between the ages of 0-11 that are likely to need care in Colorado. If we exclude those children in households with other non-working adults or older siblings (12 years and older) that could provide childcare, the number falls to just over 400 thousand. Of those, nearly 200 thousand have parents employed in industries classified as essential critical businesses and 8 thousand children have parents in essential food system industries.

We find that most of those children likely in need of care, whose parents are employed in essential food system industries, are located in the Denver area (3,879). However, other front range communities have substantial childcare needs as well: CO Springs (554), Boulder (556), Fort Collins (779), and Greeley (79). You can find these data and more at https://foodsystems.colostate.edu/covid19/child-care-needs/.

At Risk Workers:

While recent unemployment claims suggest that many in the labor force will be seeking new employment opportunities, essential critical industries may face labor shortages if infection rates rise in their workforce. Of the 2.4 million jobs in Colorado, 1.5 million of them are in essential critical industries, and of them, 346,000 are in the food supply chain. We find that 45,000 jobs involve the production and manufacturing of food while 51,000 involve transportation. COVID-19 induced labor shortages in these industries may create disruptions in the food system.

While many cases of COVID-19 appear to be mild, pre-existing health conditions may increase complications from infection. We find that 18% of the CO workforce is over 60 years old. We estimate that 16% of all jobs (390,000) and 13% of jobs in critical infrastructure industries (210,000) are filled by workers over the age of 60 with a health condition. Moreover, 49,000 workers in the food supply chain are over 60 years old with a health risk. The share of at-risk workers can be higher in more rural counties. For instance, roughly 30% of all workers in Cheyenne and Kiowa counties are over 60 with a health condition. While the total number of individuals at risk in rural counties is lower than the urban counties along the front range, widespread infection may lead demand to quickly exceed healthcare capacity.

As the economy responds to strong social distancing measures, unemployment is rapidly rising around the country. Widespread infection could cause many more workers to lose income creating additional economic hardship. We estimate that the average weekly wage of at risk workers in essential critical industries is $1,137 (or $56,000 annually, based on a 50 week year). Within the food system, average weekly wages of at-risk workers is nearly $1,490. Policy should consider lost income for workers in addition to the critical goods and services they provide.

Take-aways:

Our analysis highlights the risk of COVID-19 to the continuity of essential critical industries, several of which are part of the Colorado food system. Workers in essential critical industries face three challenges: workers with child care obligations need alternatives while schools remain closed, over one third of the workers in these industries are older than 60 with a health risk factor, and the potential loss of wages during an illness that may involve an extended recovery period. In addition to Colorado's efforts to ensure adequate availability of medical supplies and healthcare capacity, policy-makers should consider business continuity challenges and identify their fiscal, recruitment, and training needs that would be required to continue operating if their current workers fall ill.

Methods

To construct the estimates of childcare needs and workforce demographic characteristics we use data from the US Current Population Survey (CPS) Basic Monthly survey January 2018 – February 2020 accessed via IPUMS. The CPS asks information about household composition and employment characteristics. We use this information to estimate the number of workers by sector and age, as well as their potential childcare needs based on household composition. We then estimate the number of workers by industry and occupation categories that are either vulnerable to layoffs or have higher levels of risk factors that could lead to complications if infected.

To construct the estimates of at-risk workers we combine data from the National Health Interview Survey (NHIS), part of the Integrated Public Use Microdata Series, the Quarterly Census of Earnings and Wages (QCEW), from the Bureau of Labor Statistics, and the 2013 Urban-Rural Classification Scheme for counties, from the National Center for Health Statistics (NCHS). Data for health and social risk factors come from the NHIS and consist of digital "information on the health, health care access, and health behaviors of the civilian, non-institutionalized U.S. population" (Blewett et al. 2019). Each of these risk factors are listed on the interactive map. We combine the three most recent years of data from the NHIS, 2016-2018, to increase the number of survey respondents within each region-industry group. We then construct estimates of the percent of people with each combination of health and social risk factors for each region and industry in the US. We combine these region-industry-level data on worker health profiles with county-level data on employment and earnings from the QCEW.

We use the 2018 annual averages QCEW NAICS-based data files to obtain annual estimates of employment by industry (at the 3-digit NAICS level) for all reporting counties in the U.S. These data represent the number of workers who are covered by Unemployment Insurance for each employer in the county. This does not count self-employed workers and unpaid family workers, and might double count workers who are employed by multiple firms within the year. These data do not estimate the number of workers in the workforce, but rather the average number of jobs or workers employed by industry throughout the year. For each county and industry, we sum employment across all ownership types (private and local, state, and federal government) to obtain one estimate of total annual employment per

county and 3-digit NAICS industry. We then match each NAICS industry to the corresponding NHIS industry to combine with data on industry risk factors. Finally, we combine our county-industry-level estimates of at-risk workers with county-level indicators for each county's rural or urban status using the NCHS Urban-Rural Classification Scheme. We classify a county as rural if it is classified as nonmetropolitan in this classification scheme, i.e. scares a 5 or 6 in the classification scheme.

References and Data Sources

- IPUMS-CPS and IPUMS-NHIS, University of Minnesota, www.ipums.org.
- The Denver Post. More than 800 Greeley meat packing plant workers call off as coronavirus is confirmed among employees, https://www.denverpost.com/2020/03/31/jbs-meat-plant-greeley-colorado-coronavirus/
- QCEW, U.S. Bureau of Labor Statistics, https://www.bls.gov/cew/downloadable-data-files.htm
- NCHS Urban-Rural Classification Scheme for Counties, https://www.cdc.gov/nchs/data_access/urban_rural.htm

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