



Center for  
Research  
On the  
Wisconsin  
Economy

University of Wisconsin- Madison

# The Geographic Distribution of Workers Most At Risk Economically When Ordered To Stay At Home

Junjie Guo

Center for Research on the Wisconsin Economy, UW-Madison

March 26, 2020

## 1 Overview

On March 24, 2020, at the direction of Governor Tony Evers, Wisconsin issued a “safer at home” [order](#) requiring residents not to leave their home unless necessary. Similar orders to lock down the economy in an attempt to limit the spread of COVID-19 have been issued elsewhere. Different from many other countries like China, Italy and most recently the U.K., the federal government in the U.S. hasn’t issued such an order nationally, and President [Trump](#) recently expressed his willingness to move in the opposite direction and “have the country opened up ... by Easter” after his [direction](#) of 15-day social distancing ends next week, a timeline that is dramatically sooner than what many public-health experts have recommended. Instead, some state and local governments have been issuing lockdown orders on their own. At the time of this writing (11:50 pm CST on 3/25/2020), 196 million Americans in 21 states, 37 counties and 16 cities are being urged to stay at home, according to a real-time tracker by the New York [Times](#), which also noted that “A few states – Kentucky, Maryland and Nevada, for example – have walked up to the line, closing down all non-essential businesses but not issuing formal orders for people to stay home”.

## Workers Most At Risk Economically When Ordered To Stay At Home

While restricting human mobility has been [shown](#) to be effective in limiting the spread of COVID-19, its negative effect on the economy is also obvious and potentially huge. This is probably why the federal government and other states haven't issued similar orders to lock down the economy. Defending his decision against a lockdown, Florida Governor Ron DeSantis [said](#) on Monday 3/23/2020 that "When you are ordering people to shelter in place, you are consigning probably hundreds-of-thousands of Floridians to lose their jobs, you are throwing their lives into potential disarray." Similarly, Alabama Governor Kay [Ivey](#) said she did not plan to issue a statewide order because she wanted to balance the health of the state's residents with the health of the economy.

This paper provides some state-by-state estimates of the fraction of workers most at risk economically when ordered to stay at home, defined as those in occupations where (1) job tasks don't have to be performed at an arm's length or less from other people. Otherwise, the worker would be most at risk for COVID-19 and already affected by the social distancing guideline that requires people to stay at least 6 feet away from each. This also excludes most medical workers who are considered essential and thus exempt from a stay-at-home order; (2) the annual wage is at the bottom end of the wage distribution; and (3) some job tasks have to be performed away from home for at least some time every week, making it nearly impossible to work exclusively from home for an extended period of time. For these workers, staying at home most likely means unemployment and economic hardship, a choice they would not make unless being ordered to do so, even if such an order is the best way to limit the spread of COVID-19 and thus socially optimal.

In practice, we consider two versions. The first and more conservative version requires (2) the annual wage to be in the bottom *quarter* of the wage distribution and (3) job tasks have to be performed outside home for at least *two days* every week. In contrast, the second and less conservative version requires (2) the annual wage to be in the bottom *half* of the wage distribution and (3) job tasks have to be performed outside home for at least *some time* every week.

Under the first definition, we find about 9.7% of employed workers are at high risk economically in the U.S. Should half of them lose their jobs, the unemployment rate would rise by about 5 percentage points. The two numbers would increase to about 26% and 13 percentage points respectively under the second and less conservative definition.

Across states, we find substantial variation in the fraction of workers most at risk economically under both definitions. Under the first definition, the fraction varies from a low of about 8.4% in Vermont to a high of 12.3% in Nevada. The value for Wisconsin is 9.3%, close to the national average. Under the second definition, the fraction varies from a low of about 21.4% in Alaska to a high of 29.8% in Kentucky. The value for Wisconsin is 27.4%, slightly above the national average.

Other things equal, we should expect states with a lower fraction of workers most at risk economically to have a larger incentive to require their residents to stay at home. Empirically, we do find this to be the case. On average, the fraction of workers most at

## Workers Most At Risk Economically When Ordered To Stay At Home

risk economically is lower in the 21 states that have issued such an order than other states that haven't done so by 3/25/2020, although the differences are small (9.5% vs 9.8% under the first definition, and 25% vs 26.4% under the second).

Overall, and not surprisingly, the numbers suggest that the cost of locking down the economy is huge, as confirmed by the historically large [number](#) of over 3.2 million initial unemployment insurance weekly claims released today, and it's larger in some states than others. This cost should be taken into consideration when a state decides whether to take the dramatic measure. We will provide more analysis concerning this choice, including its impact, in the future.

## 2 Data and Results

We use two datasets, the Occupational Information Network ([O\\*NET](#)) developed under the sponsorship of the U.S. Department of Labor and the Occupational Employment Statistics ([OES](#)) from the Bureau of Labor Statistics. Both data reports information for over 800 detailed occupations. For each occupation, OES reports the employment and average annual wage both nationally and for each state. We use the data from May 2018, the latest one available at this time.

Among other things, O\*NET has a list of thirty variables describing the physical work conditions for each occupation. One of them is physical proximity asking "To what extent does this job require the worker to perform job tasks in close physical proximity to other people?" We use this variable to exclude workers whose occupation requires him/her to be at an arm's length or less from other people, because they would be affected directly by the social distancing guideline already in place that requires people to stay at least 6 feet away from each other. This also excludes most medical workers who are considered essential and thus exempt from a stay-at-home order.

Using the remaining occupations where job tasks don't have to be performed at an arm's length or less from other people, we consider two definitions of workers most at risk economically when ordered to stay at home. The first one is more conservative, and it includes workers in occupations where (1) the annual wage is in the bottom quarter of the wage distribution, and (2) job tasks have to be performed outside home for at least two days a week, making it nearly impossible to work exclusively from home for an extended period of time. The last requirement is calculated from 27 of the 30 questions on physical work conditions in O\*NET. In addition to physical proximity, we also exclude "How often does this job require working indoors in environmentally controlled conditions?" and "How much does this job require sitting?" because these two questions are less informative about working from home. Two examples of the remaining questions we use are "How often does this job require exposure to hazardous conditions?" and "How often does this job require working outdoors, exposed to all weather conditions?" The answer to each of these questions is a value between 0 and 100, with larger numbers corresponding to higher frequencies. In particular, a value of 75 corresponds to "Once a week or more but not every day", and a value of 100 corresponds to "Every day". An

## Workers Most At Risk Economically When Ordered To Stay At Home

occupation is said to satisfy (3) if at least one of the 27 questions has a value of 86 or above.

Table 1 lists the top twenty occupations satisfying the definition ranked by employment size. The top one is combined food preparation and serving workers (including fast food), with an employment of over 3.67 million and an annual wage of slightly about \$22,140. Other examples include janitors, maids and housekeeping cleaners, and dishwashers.

Table 1. Top Twenty Occupations (by Employment Size) Most At Risk Economically

Occupation	Employment	Wage
Combined Food Preparation and Serving Workers, Including Fast Food	3,676,180	22,140
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,156,270	28,950
Stock Clerks and Order Fillers	2,056,030	28,520
Maids and Housekeeping Cleaners	924,290	25,570
Food Preparation Workers	814,600	24,830
Packers and Packagers, Hand	663,970	26,490
Dishwashers	504,770	23,190
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	473,860	23,240
Cooks, Institution and Cafeteria	400,320	28,290
Cleaners of Vehicles and Equipment	378,850	26,900
Helpers--Production Workers	350,410	29,380
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	287,420	26,450
Food Servers, Nonrestaurant	266,190	24,980
Laundry and Dry-Cleaning Workers	213,350	24,480
Nonfarm Animal Caretakers	199,850	25,890
Cooks, Short Order	155,840	25,140
Sewing Machine Operators	136,450	26,990
Automotive and Watercraft Service Attendants	113,760	25,940
Tire Repairers and Changers	111,620	29,530
Slaughterers and Meat Packers	75,550	28,450

## Workers Most At Risk Economically When Ordered To Stay At Home

Nationally, these occupations employ about 14 million workers representing 9.7% of all employed. Should half of these workers lose their jobs, the unemployment would rise by about 7 million and the unemployment rate would increase by about 5 percentage points. Across states, the fraction of such economically vulnerable workers varies from a low of about 8.4% in Vermont to a high of 12.3% in Nevada. The value for Wisconsin is 9.3%, close to the national average.

Table 2. Top Twenty Occupations (by Employment Size) Most At Risk Economically  
Less Conservative Classifications

Occupation	Employment	Wage
Retail Salespersons	4,448,120	28,310
Combined Food Preparation and Serving Workers, Including Fast Food	3,676,180	22,140
Cashiers	3,635,550	23,240
Laborers and Freight, Stock, and Material Movers, Hand	2,893,180	30,890
Customer Service Representatives	2,871,400	36,470
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2,156,270	28,950
Stock Clerks and Order Fillers	2,056,030	28,520
Construction Laborers	1,001,470	40,350
Maids and Housekeeping Cleaners	924,290	25,570
Light Truck or Delivery Services Drivers	915,310	36,920
Food Preparation Workers	814,600	24,830
Packers and Packagers, Hand	663,970	26,490
Shipping, Receiving, and Traffic Clerks	655,590	34,980
Industrial Truck and Tractor Operators	604,130	36,480
Childcare Workers	564,630	24,610
Dishwashers	504,770	23,190
Cooks, Fast Food	487,510	22,650
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	473,860	23,240
Cooks, Institution and Cafeteria	400,320	28,290
Packaging and Filling Machine Operators and Tenders	395,330	32,740

## Workers Most At Risk Economically When Ordered To Stay At Home

The second definition of workers most at risk economically is less conservative, and it relaxes the two requirements in the first definition to be (1) the annual wage is in the bottom *half* of the wage distribution, and (2) job tasks have to be performed outside home for at least *some time* a week. An occupation is said to satisfy (3) if at least one of the 27 questions has a value of 76 or above.

Table 2 lists the two 20 occupations under this definition ranked by employment size. The largest occupation under this definition is retail salespersons, with an employment of over 4.4 million and an annual wage of \$28310. Some other new occupations not in the first definition are cashiers and construction laborers. Nationally, these occupations employ about 37 million workers representing about 26% of all employed. Should half of these workers lose their jobs, the unemployment would rise by about 18.5 million and the unemployment rate would increase by about 13 percentage points. Across states, the fraction of such economically vulnerable workers varies from a low of about 21.4% in Alaska to a high of 29.8% in Kentucky. The value for Wisconsin is 27.4%, slightly above the national average.

Figure 1 plots the fraction of workers most at risk economically for each state, with estimates from the first definition on the vertical axis and those from the second definition on the horizontal axis. The 21 states that have urged their residents to stay at home are colored in red, while other states are colored in blue.

Other things equal, we should expect states with a lower fraction of workers most at risk economically to have a larger incentive to require their residents to stay at home. Empirically, we do find this to be the case. On average, the fraction of workers most at risk economically is lower in the 21 states that have issued such an order than other states that haven't done so by 3/25/2020, although the differences are small (9.5% vs 9.8% under the first definition, and 25% vs 26.4% under the second).

Overall, and not surprisingly, the numbers suggest that the cost of locking down the economy is huge, as confirmed by the historically large [number](#) of over 3.2 million initial unemployment insurance weekly claims released today, and it's larger in some states than others. This cost should be taken into consideration when a state decides whether to take the dramatic measure. We will provide more analysis concerning this choice, including its impact, in the future.

Workers Most At Risk Economically When Ordered To Stay At Home

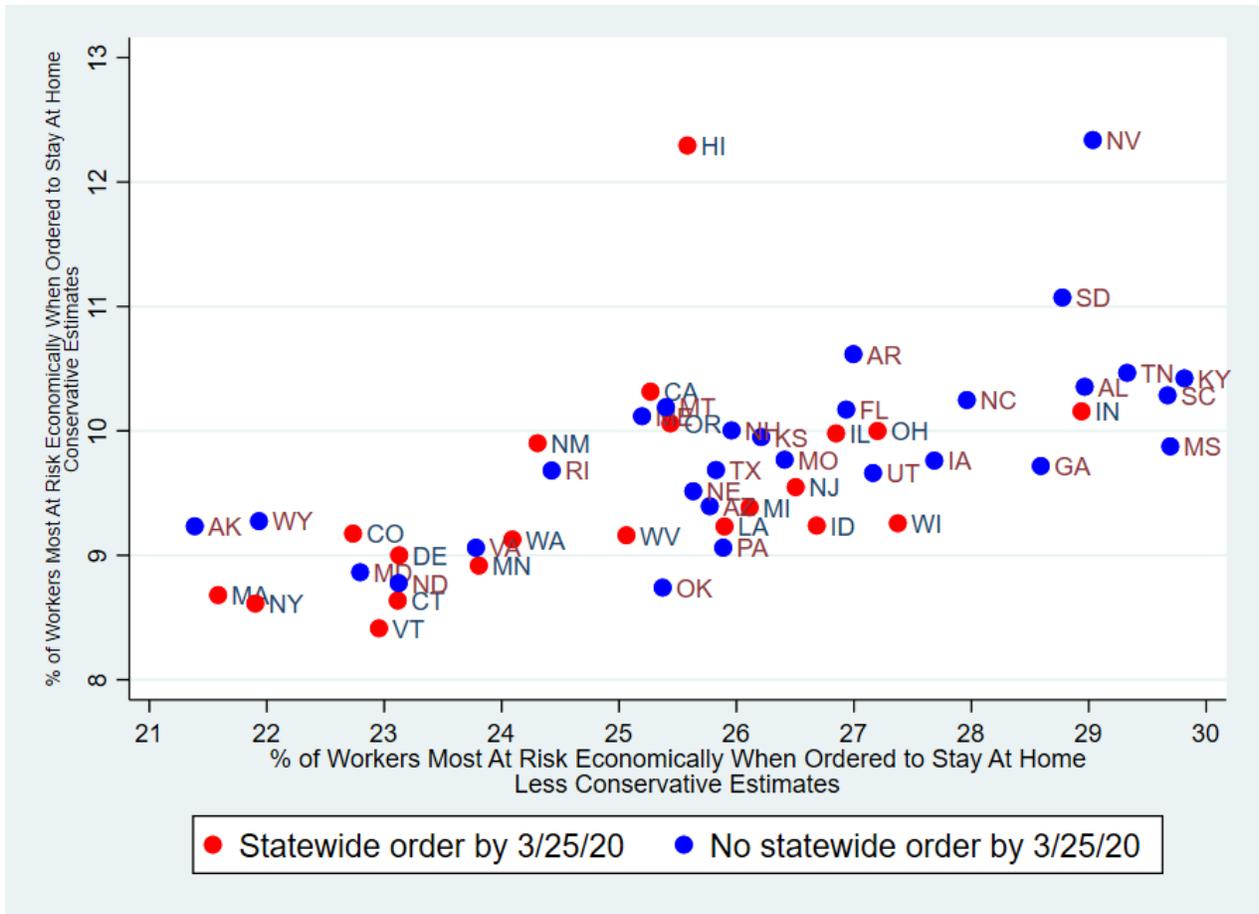


Figure 1. Workers Most At Risk Economically When Ordered To Stay At Home