Analysis of Current Population Survey data suggests a tightening labor market for registered nurses, licensed practical nurses, and nursing assistants, marked by falling employment and rising wages through June 2021. Unemployment rates remain higher in nonhospital settings and among registered nurses and nursing assistants who are members of racial and ethnic minority groups.

With the onset of the COVID-19 pandemic and the immediate shutdown of economic activity in March 2020, overall employment in health care dropped precipitously in all sectors (exhibit 1). As employment gradually resumed (except in nursing facilities), the prevailing dynamic in the health care labor market shifted from furloughs to reports of burnout and nurse shortages. Amid this shifting landscape, there has been no systematic analysis of workforce data to increase understanding of the economic impacts on nurses. Using national data from federal government surveys, we provide a snapshot of the pandemic’s impacts on employment and earnings across categories of the nurse workforce by major employment setting and by race and ethnicity over the course of the first fifteen months of the pandemic. Although we are unable to definitively attribute these impacts to changes in supply of or demand for nurses, the observed trends shed light on broader workforce dynamics affecting this critical workforce.

**Exhibit 1**

Total monthly employment in the US nurse workforce in major health care sectors relative to February 2020, 2020-21

SOURCE Authors’ calculations of data reported in Bureau of Labor Statistics, Employment situation (note 2 in text).
Study Data And Methods
To understand how overall employment in health care has been affected by the pandemic, we obtained aggregate data from the Bureau of Labor Statistics for the period February 2020–June 2021. Payroll data are collected each month from a sample of roughly 144,000 non-agricultural business establishments representing 697,000 worksites reported by industry sector. To identify how overall employment trends have affected nurses, we obtained monthly data from the Current Population Survey (CPS) between January 2011 and June 2021. The CPS, administered by the Census Bureau, is used by the federal government to report monthly unemployment rates. It collects information from approximately 125,000 people and, unlike other data sources, identifies the occupations of those sampled. Using this data source enabled us to obtain monthly samples of approximately 1,300 registered nurses (RNs), 250 licensed practical or vocational nurses (LPNs), and 850 nursing aides or assistants (NAs). These data are available one to two months after collection, making the CPS one of the few sources of individual-level workforce data from both before and during the COVID-19 pandemic.

Respondents to the CPS are asked about their employment status, industry of employment, weekly earnings and hours worked, and demographic information (only one-quarter of the sample is asked about their earnings each month). We constructed quarterly estimates of full-time-equivalent (FTE) employment, hourly wages, and unemployment rates for RNs, LPNs, and NAs. All estimates were weighted by sampling weights, making them nationally representative. FTE employment is defined as usual weekly hours worked divided by 40, summed over all individuals who were working in the week of the survey. The hourly wage is defined as usual weekly earnings divided by usual weekly hours and is weighted by hours worked. The unemployment rate is the number of people unemployed and looking for work as a percentage of the labor force (those employed or unemployed). Monthly estimates were averaged across months to form quarterly estimates. Tests of significance adjusted standard errors to account for the use of sampling weights. For estimates of total employment, we applied methods suggested by the Census Bureau.

The CPS has some limitations. First, occupation is only identified for those in the labor force and is based on their current or most recent job. Therefore, we had no information on nurses who were working in other settings or were out of the labor force. Second, although response rates in the CPS generally exceed 80 percent, they declined in the early months of the pandemic and were in the range of 65–75 percent from March through August 2020. However, our estimates used the CPS sample weights that adjusted for the declining response rates, which should have minimized potential bias.

Study Results
The decline in overall health care employment shown in exhibit 1 is unprecedented; as far back as 1990, overall health care employment had never decreased. The decline varied by sector. By April 2020 employment had decreased most in physician offices (−11 percent), outpatient care centers (−8 percent), and home health care (−7 percent). Employment decreased least in hospitals (−2 percent), the largest employer of RNs, partly because of an influx of patients with COVID-19 and other patients whose care could not be delayed. Nursing homes saw only a small decline as of April 2020 (−3 percent), but unlike in other sectors, the decline in nursing homes continued into 2021.

Employment in most sectors gradually returned toward prepandemic levels over the course of 2020, except in the nursing home sector, where the decline continued steadily. Employment levels had rebounded in hospitals (−2.2 percent), physician offices (−0.7 percent), and outpatient centers (+2.6 percent) by June 2021. However, fifteen months into the pandemic, total employment in nursing homes remained 13.2 percent lower than it had been in February 2020.

Exhibit 2 shows the numbers of FTE nurses employed from the first quarter of 2011 through the second quarter of 2021. Over the course of these ten years, total employment of LPNs and NAs was relatively flat, whereas RN employment increased steadily from around 2.4 million in 2011 to slightly less than 3.0 million in 2020. Once the pandemic began, employment of RNs

Unemployment has remained relatively high among RNs and NAs who are members of racial and ethnic minority groups.
leveled off while employment of LPNs and NAs decreased. Compared with the five quarters just before the pandemic (October 2018–December 2019), in the five-quarter period from April 2020 to June 2021, total employment decreased 20 percent for LPNs ($p < 0.01$) and 10 percent for NAs ($p < 0.01$). Among RNs, although employment decreased just 1 percent compared with the five previous quarters ($p = 0.66$), the trend represented a significant departure when compared with the 2011–20 prepandemic trend ($p = 0.048$). In addition, the drop in RN supply was greater (5 percent) among RNs ages fifty and older ($p = 0.23$) than it was for all RNs (1 percent). The steep employment drop for LPNs was in part driven by the higher proportion of these nurses employed in residential facilities, in which LPN employment decreased 24 percent ($p < 0.01$) (data not shown).

Although the pandemic is associated with a decrease in employment, it seems to have positively affected nurses’ earnings. Hourly earnings for all three occupations were relatively unchanged through 2019 (exhibit 3). However, LPNs and NAs saw greater increases: Earnings increased by 9.4 percent for LPNs ($p < 0.01$) and 5.7 percent for NAs ($p < 0.01$) from April 2020 to June 2021, but just 2.0 percent ($p = 0.14$) for RNs. Hourly earnings increased even more for those working in hospitals (18.6 percent for LPNs [$p < 0.01$], 11.3 percent for NAs [$p < 0.01$], and 2.5 percent for RNs [$p = 0.13$]; data not shown). Earnings rose somewhat more for lower-paid LPNs and RNs; earnings for those initially paid at the twenty-fifth percentile of earnings increased by 12.2 percent for LPNs ($p < 0.01$) and 3.8 percent for RNs ($p = 0.13$), whereas those initially paid at the seventy-fifth percentile of earnings saw their income rise by only 6.3 percent for LPNs ($p = 0.13$) and 1.8 percent for RNs ($p = 0.29$) (data not shown).

We gained additional insight into the pandemic’s impacts on the nurse workforce by tracking unemployment rates, which are indicators of slack demand in the labor market, as they reflect the extent to which individuals are looking for—but unable to find—work. Exhibit 4 indicates that after rising for all nurses in the second and third quarters of 2020, unemployment levels dropped back to approximately prepandemic levels for RNs and LPNs, but not for NAs. For context, every 1 percentage point of unemployment implies roughly an additional 30,000 unemployed RNs, 6,000 unemployed LPNs, and 20,000 unemployed NAs. Therefore, between the first quarter of 2020 and the peak unemployment rates observed in the second and third quarters of 2020, unemployment increased by approximately 100,000 RNs, 25,000 LPNs, and 90,000 NAs.
Exhibit 3

Hourly earnings for registered nurses, licensed practical or vocational nurses, and nursing aides or assistants in the US, 2011–21

Hourly earnings

$35 –

$30 –

$25 –

$20 –

$15 –

$10 –

$5 –

$0 –

Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4 Q1 2 3 4


SOURCE Authors’ calculations using data from the Current Population Survey (CPS).

NOTES Data available for the first two quarters of 2021 only. Earnings are expressed in 2020 dollars, deflating by the Consumer Price Index. Hourly earnings are calculated as usually weekly earnings over usual weekly hours worked and are weighted by hours worked and population weights provided in the CPS. The vertical dotted line indicates the outbreak of COVID-19 in the US.

Exhibit 4

Unemployment among registered nurses, licensed practical or vocational nurses, and nursing aides or assistants in the US, 2019–21

Unemployed

9% –

8% –

7% –

6% –

5% –

4% –

3% –

2% –

1% –

0% –

2019 Q1 2020 Q1 2021

2019 Q1 2020 Q1 2021

2019 Q1 2020 Q1 2021

Lifetime

Registered nurses

Licensed practical or vocational nurses

Nursing aides or assistants

SOURCE Authors’ calculations using data from the Current Population Survey (CPS).

NOTES Estimates based on population weights provided in the CPS. The bars for 2019 are averages of all four quarters. Data available for the first two quarters of 2021 only. The widespread outbreak of COVID-19 began in the US in March 2020 and accelerated in April 2020.
Although unemployment among all groups we studied spiked in the second quarter of 2020 (exhibit 5), RNs and NAs who were Asian, Black, Hispanic, and members of other racial and ethnic minority groups experienced higher unemployment than their non-Hispanic White counterparts in subsequent quarters. For example, in the second quarter of 2021, unemployment rates of White RNs and NAs were below what they had been in 2019, whereas unemployment rates for RNs and NAs in racial and ethnic minority groups were 1.6 ($p = 0.02$) and 2.7 ($p < 0.01$) percentage points higher, respectively, than they had been in 2019. This corresponds to roughly 16,000 more RNs and 30,000 more NAs in racial and ethnic minority groups who were unemployed in the second quarter of 2021 than there would have been if they had had the same unemployment rate as they had pre-pandemic in 2019.

Unemployment during the pandemic also has varied by whether a nurse was most recently employed in a hospital or nonhospital setting for RNs, LPNs, and NAs ($p < 0.01$ for each). Exhibit 6 shows that the hospital nurse workforce was less affected by the pandemic than the nonhospital workforce. Unemployment of RNs, LPNs, and NAs in hospitals was lower before the pandemic, rose less at the beginning of the pandemic, and returned to prepandemic levels more quickly compared with unemployment of those in nonhospital settings. Although overall employment has fallen much more in nursing homes than in other nonhospital sectors, the trends in unemployment for RNs, LPNs, and NAs were similar across these settings. For example, unemployment of NAs increased 1.8 percentage points between 2019 and the second quarter of 2021 in nursing homes while rising 1.7 percentage points in all other nonhospital sectors (data not shown).

**Discussion**

The COVID-19 pandemic has had dramatic impacts on health care delivery organizations and the nurse workforce they employ. Results suggest that employment of nurses in the US fell early in the pandemic because of lack of demand as people reduced their use of health care. As the pandemic wore on, use of health care services resumed, but employment levels of nurses re-

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**EXHIBIT 5**

Unemployment rates among registered nurses, licensed practical or vocational nurses, and nursing aides or assistants in the US, by race and ethnicity, 2019–21

<table>
<thead>
<tr>
<th>Unemployed</th>
<th>10%</th>
<th>9%</th>
<th>8%</th>
<th>7%</th>
<th>6%</th>
<th>5%</th>
<th>4%</th>
<th>3%</th>
<th>2%</th>
<th>1%</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered nurses</td>
<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Licensed practical or vocational nurses</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Nursing aides or assistants</td>
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</tr>
</tbody>
</table>

**Source**: Authors’ calculations using data from the Current Population Survey (CPS). **Notes**: Estimates based on population weights provided in the CPS. The bars for 2019 are averages of all four quarters. Data available for the first two quarters of 2021 only. The widespread outbreak of COVID-19 began in the US in March 2020 and accelerated in April 2020. Because of small samples, nurses who were Asian, Black, Hispanic, and members of other racial and ethnic minority groups were grouped together compared with nurses who were White.
mained low while unemployment rates receded and wages increased. This suggests a tightening labor market in which employers could not hire as many nurses as they wanted—that is, there was a lack of supply.

One exception to this pattern is the nursing home sector, where total employment remains more than 10 percent below prepandemic levels. This is similar to the proportion of nursing home residents who died of COVID-19, suggesting that the need for nursing care in these settings might have not returned to its previous level. Unemployment has also remained relatively high among RNs and NAs who are members of racial and ethnic minority groups, consistent with general unemployment patterns that have been observed during the pandemic.

Given the falling employment of LPNs and NAs, as well as RN employment that has plateaued after decades of steady growth, the important question for the longer term is whether these trends will continue. With regard to exit from the workforce, an estimated 660,000 baby-boom RNs are still working during the pandemic, the vast majority of whom are expected to retire by 2030. If, however, substantial numbers of these older RNs exit the workforce earlier than they had planned, the size of the nurse workforce could decrease more quickly and disrupt nurse labor markets throughout the country. Regarding entry, it is unclear whether the pandemic will lead to increased or decreased interest in nursing. One indicator is the number of applicants to four-year nursing programs, which grew just 1.5 percent in 2020 compared with increases of 4.5 percent and 8.5 percent in the prior two years. As a consequence, these exit and entry questions bear careful watching.

EXHIBIT 6

Unemployment rates among registered nurses, licensed practical or vocational nurses, and nursing aides or assistants in the US, by hospital and nonhospital settings, 2019–21

<table>
<thead>
<tr>
<th>Year</th>
<th>Registered nurses</th>
<th>Licensed practical or vocational nurses</th>
<th>Nursing aides or assistants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
</tr>
<tr>
<td>0%</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations using data from the Current Population Survey (CPS). Notes: Estimates based on population weights provided in the CPS. The bars for 2019 are averages of all four quarters. Data available for the first two quarters of 2021 only. The widespread outbreak of COVID-19 began in the US in March 2020 and accelerated in April 2020. “All other settings” includes all industry sectors where these providers work, with the major settings including nursing homes, home health care, outpatient care centers, and physician offices.
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