

# Missed Opportunities

## Credential Shortages in Programs Leading to High-Paying Middle-Skills Jobs in 55 US Metro Areas

Anthony P. Carnevale  
Zachary Mabel  
Emma Nyhof  
Kathryn Peltier Campbell

*Georgetown University Center on Education and the Workforce*

*Background: The Georgetown University Center on Education and the Workforce (GUCEW) has analyzed education and labor-market data to determine whether credential providers in large metro areas are producing enough certificates and associate's degrees to keep up with the projected local demand for early-career workers in high-paying middle-skills jobs. GUCEW has used the results to create the accompanying [online data tool](#) (currently in unreleased beta version for review). When released, the tool will allow policy leaders, employers, educators, and members of the public to explore which metro areas will have credential shortages—representing missed opportunities to prepare more workers for high-paying middle-skills occupations. This memo summarizes initial high-level findings from the analysis of 55 major metro areas, with a focus on 10 of JPMorgan Chase's priority metro areas. The public release of the online data tool and a report about the findings will occur in spring 2025, following further analysis and refinement.*

High-paying jobs for early-career middle-skills workers<sup>1</sup> are those that boast annual earnings above \$53,000 (in 2022 dollars), exceeding the median annual earnings of young workers with a bachelor's degree.<sup>2</sup> Middle-skills workers in these jobs not only out-earn most young workers with a bachelor's degree but also experience considerable earnings growth over time, with median annual earnings that rise to \$80,000 by mid-career.

Economic opportunity exists in these high-paying middle-skills jobs for American workers without a bachelor's degree. But where can young workers find these jobs—that is, in what occupations are they prevalent? What credentials do young workers need in order to enter these occupations? And are education and training providers producing enough of these credentials to meet local demand?

---

<sup>1</sup> We define “early-career middle-skills workers” as those ages 18–35.

<sup>2</sup> One-quarter of early-career middle-skills workers earn more than \$53,000 per year. The median annual earnings of young workers with a bachelor's degree (ages 21–30) is \$52,200 (in 2022 dollars). We use an age range that skews slightly older for early-career middle-skills workers since they often need more time in the workforce to earn as much as young workers with a bachelor's degree. This is for two reasons: (1) returns to work experience typically accrue more gradually than returns to a bachelor's degree, and (2) returns to work experience typically accrue faster for more educated workers.

To answer these questions, we identified 107 high-paying middle-skills occupations—that is, occupations in which more than half of early-career middle-skills workers have a high-paying job. These high-paying occupations are found in five occupational groups: management; science, technology, engineering, and mathematics (STEM); healthcare; protective services; and blue-collar jobs. They include such positions as facilities managers, information security analysts, radiologic technicians, firefighters, and power plant operators.<sup>3</sup>

We then assessed the current production of middle-skills credentials (certificates and associate's degrees) linked to these occupations at a national level and in each of the 55 metro areas with populations of at least 1 million residents. We compared this credential production with the projected demand for workers with these credentials through 2032. Our goal was to identify where middle-skills providers would need to produce more credentials, and in which fields, to meet projected local demand.<sup>4</sup> In metro areas that will face credential shortages, we also estimated each middle-skills education and training provider's potential contribution to addressing the local shortage.

Our analysis generated five major findings:

1. Nearly all major metro areas will face a **severe shortage** of locally produced credentials leading to high-paying middle-skills **blue-collar** occupations, as will the nation at large.
2. Most major metro areas also **are not producing enough** credentials leading to high-paying middle-skills **management** and **protective services** occupations.
3. Most major metro areas **are producing enough** credentials aligned to high-paying middle-skills **STEM** occupations to fill projected local needs, masking a nationwide shortage of these credentials.
4. **Healthcare** is the only occupational group with a **nationwide oversupply** of credentials that lead to high-paying middle-skills jobs.
5. To eliminate local shortages, many providers would **need to more than double** the number of credentials they award in programs aligned to high-paying middle-skills occupations.

Finding 1: Nearly all major metro areas will face a **severe shortage** of locally produced credentials leading to high-paying middle-skills **blue-collar** occupations, as will the nation at large.

The greatest shortage of workers prepared for high-paying middle-skills occupations will be in the **blue-collar** sector. Nationwide, if annual credential production in programs aligned to these occupations stays at current levels, the credential supply will meet only 18 percent of the projected annual demand through 2032. Fifty-one of the 55 largest metro areas in the country will face a credential shortage in

---

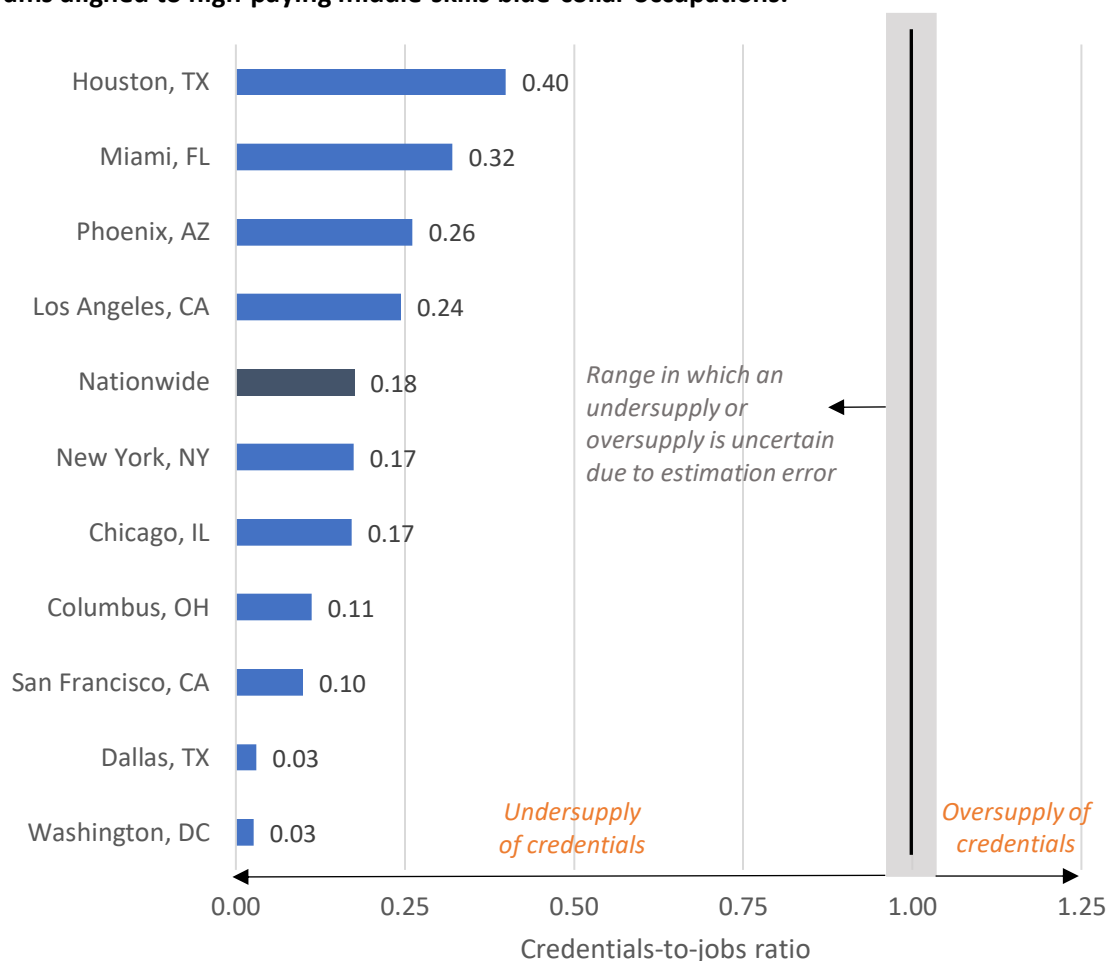
<sup>3</sup> View a complete list of high-paying middle-skills occupations and aligned programs according to the program of study-to-occupation (CIP-SOC) crosswalk developed by the US Bureau of Labor Statistics and US Department of Education [here](#).

<sup>4</sup> The sample sizes in the American Community Survey data we used for this analysis are too small to produce reliable results for smaller metro and non-metro areas.

these programs, and the credentials-to-jobs ratio<sup>5</sup> is less than 0.4 in three-quarters of major metro areas<sup>6</sup>—meaning that current credential production in these metro areas meets less than 40 percent of the projected annual demand.

These findings indicate that middle-skills providers need to produce more credentials leading to high-paying blue-collar occupations in nearly every major metro area, including 10 of JPMorgan Chase’s priority metro areas (Figure 1).

**Figure 1. Ten of JPMorgan Chase’s priority metro areas will face a severe credential shortage in programs aligned to high-paying middle-skills blue-collar occupations.**



<sup>5</sup> The credentials-to-jobs ratio is the metro area’s ratio of the annual number of credentials produced that align with high-paying middle-skills occupations within the occupational group to the projected annual number of job openings available in all occupations for workers with those credentials.

<sup>6</sup> Ratio values below one indicate a shortage in credential production, values above one indicate a surplus in credential production, and values equal to one indicate perfect alignment between credential production and future occupational demand. Because of estimation error in our credentials-to-jobs alignment ratios, metro areas with ratio values less than one may not have credential shortages, while those with ratio values greater than one may not have surpluses. To account for the estimation error, we identify credential shortages only when the credentials-to-jobs ratio is less than 0.93. When the ratio value falls below this threshold, there is a greater than 95 percent likelihood that the metro area is experiencing a true credential shortage.

Source: Georgetown University Center on Education and the Workforce analysis of data from the US Bureau of Labor Statistics, Employment Projections, 2023; US Census Bureau, American Community Survey, 2010–22; and US Department of Education, Integrated Postsecondary Education Data System, 2019–21.

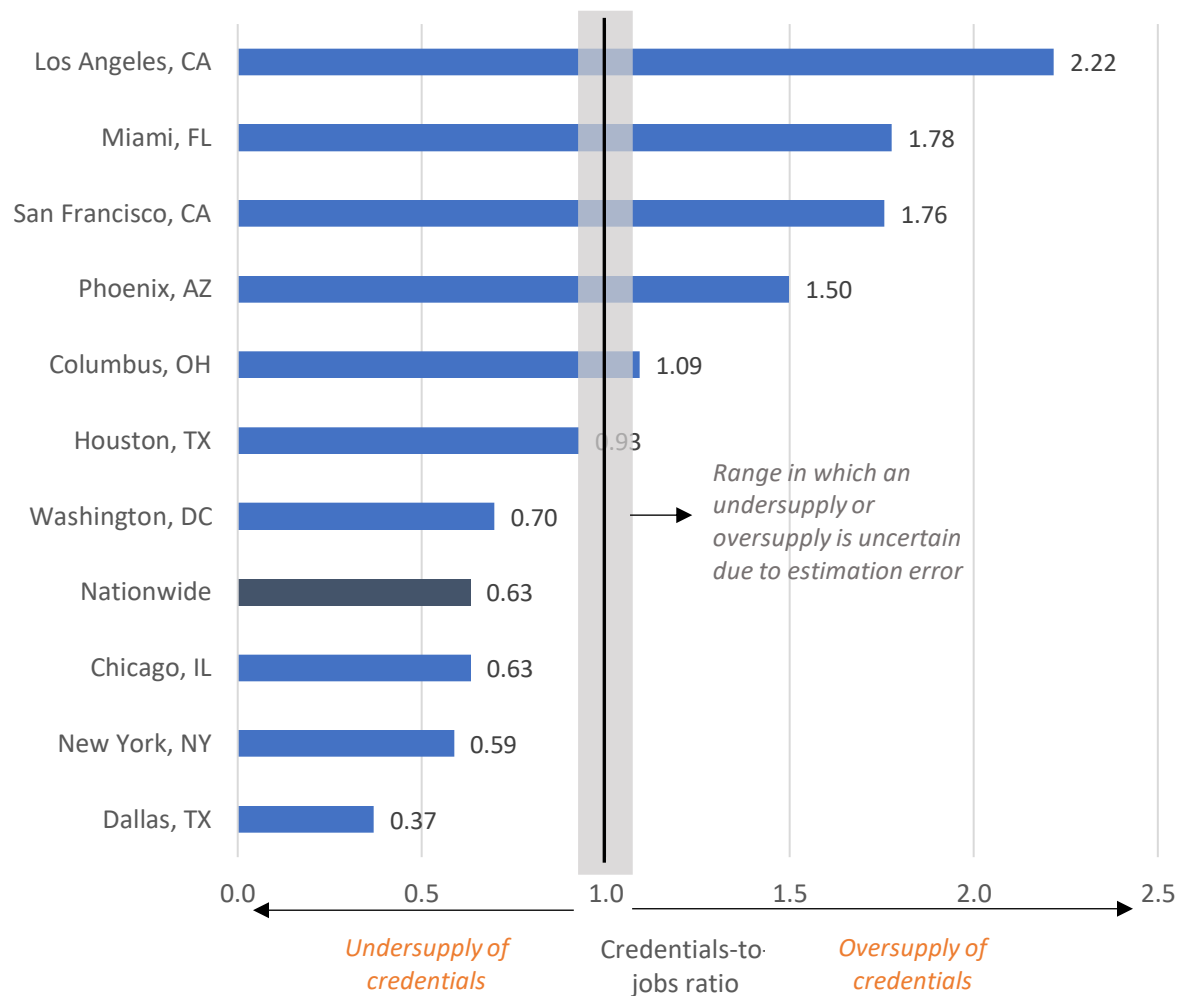
Note: We identify metro areas with credentials-to-jobs ratio values below 0.93 as those that will experience credential shortages. We do this to account for estimation error, as some metro areas with ratio values below one may not have credential shortages. When the ratio value falls below 0.93, there is a greater than 95 percent likelihood that a metro area will face a true credential shortage.

## Finding 2: Most major metro areas also **are not producing enough** credentials leading to high-paying middle-skills **management** and **protective services** occupations.

Nationwide, if annual credential production in programs aligned to high-paying middle-skills **management** occupations stays at current levels, the credential supply will meet 63 percent of the projected annual demand through 2032. Among the 55 largest US metro areas, 37 will face a credential shortage in high-paying middle-skills management occupations. In the remaining 18 metro areas, credential production either will be close to or will exceed local demand. Thus, expanding credential production in these 18 metro areas may not benefit local employers or the middle-skills workforce.

Our results indicate that middle-skills providers in six of JPMorgan Chase’s priority metro areas are annually producing enough credentials aligned to high-paying middle-skills management occupations to meet future local demand. In some metro areas, the oversupply of credentials is quite large: in Los Angeles, for example, the credentials-to-jobs ratio is 2.22, indicating that annual credential production is more than twice the projected annual demand. However, in Chicago, Dallas, New York, and Washington, DC, providers are producing too few credentials aligned to these occupations (Figure 2).

**Figure 2. Four of JPMorgan Chase’s priority metro areas will face a credential shortage in programs aligned to high-paying middle-skills management occupations, with Dallas experiencing the most severe shortage.**

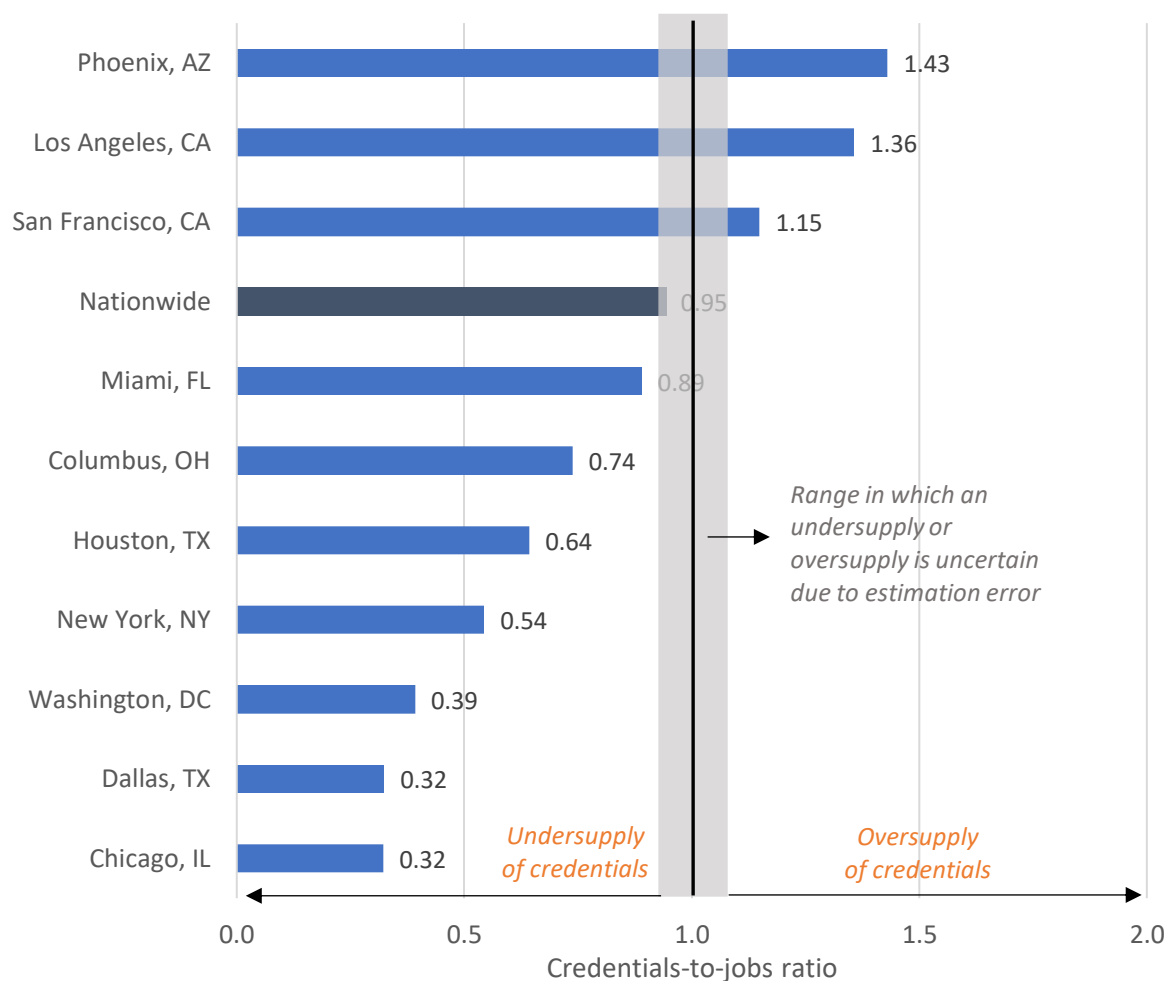


Source: Georgetown University Center on Education and the Workforce analysis of data from the US Bureau of Labor Statistics, Employment Projections, 2023; US Census Bureau, American Community Survey, 2010–22; and US Department of Education, Integrated Postsecondary Education Data System, 2019–21.

Note: We identify metro areas with credentials-to-jobs ratio values below 0.93 as those that will experience credential shortages. We do this to account for estimation error, as some metro areas with ratio values below one may not have credential shortages. When the ratio value falls below 0.93, there is a greater than 95 percent likelihood that a metro area will face a true credential shortage.

In high-paying middle-skills **protective services** occupations, annual credential production nationwide aligns with the projected demand for workers, but most major metro areas will experience a credential shortage. Thirty-four of the 55 largest metro areas will face a credential shortage in high-paying middle-skills protective services occupations, including seven of JPMorgan Chase’s priority metro areas: Chicago, Columbus, Dallas, Houston, Miami, New York, and Washington, DC (Figure 3).

**Figure 3. Among JPMorgan Chase’s priority metro areas, providers in Chicago, Dallas, and Washington, DC, have the greatest need to expand credential production in programs aligned to high-paying middle-skills protective services occupations.**



Source: Georgetown University Center on Education and the Workforce analysis of data from the US Bureau of Labor Statistics, Employment Projections, 2023; US Census Bureau, American Community Survey, 2010–22; and US Department of Education, Integrated Postsecondary Education Data System, 2019–21.

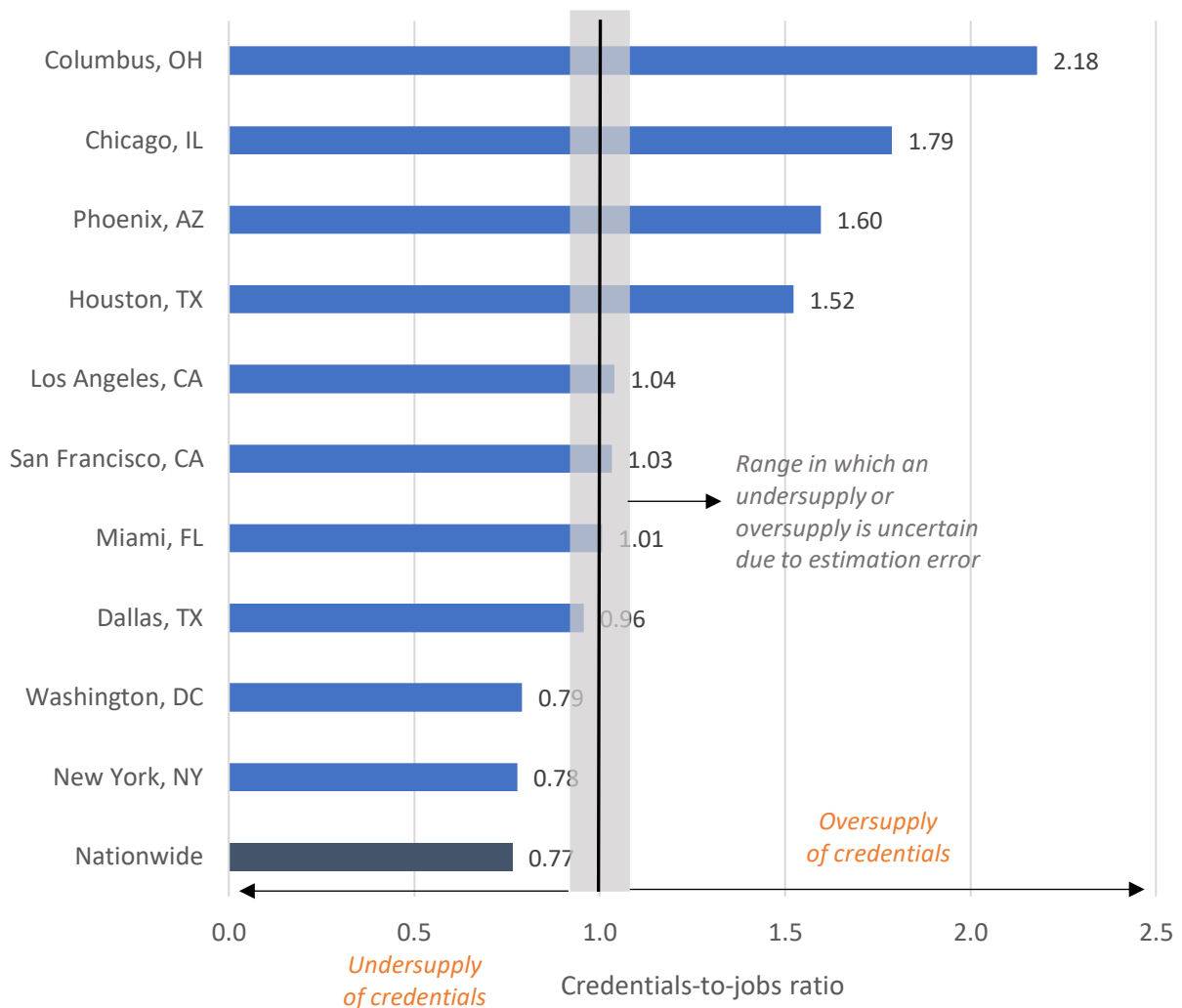
Note: We identify metro areas with credentials-to-jobs ratio values below 0.93 as those that will experience credential shortages. We do this to account for estimation error, as some metro areas with ratio values below one may not have credential shortages. When the ratio value falls below 0.93, there is a greater than 95 percent likelihood that a metro area will face a true credential shortage.

Finding 3: Most major metro areas **are producing enough** credentials aligned to high-paying middle-skills **STEM** occupations to fill projected local needs, masking a nationwide shortage in these credentials.

In most major metro areas, credential production exceeds local demand in high-paying middle-skills **STEM** occupations. However, such overproduction is not the norm nationwide: across the country, middle-skills providers are producing too few graduates prepared for these occupations, with the current supply of credentials nationwide meeting only 77 percent of the projected demand.

Underproduction in some of the largest STEM hubs helps explain why there is a nationwide credential shortage, despite the oversupply in most metro areas with smaller STEM sectors. Ten of the largest STEM hubs in the country—including Boston, New York, and Washington, DC—will face credential shortages in high-paying middle-skills STEM jobs. Two of these areas—New York and Washington, DC—are among JPMorgan Chase’s priority metro areas (Figure 4).

**Figure 4. New York and Washington, DC, are the only metro areas among JPMorgan Chase’s priority areas that will face a credential shortage in programs aligned to high-paying middle-skills STEM occupations.**



Source: Georgetown University Center on Education and the Workforce analysis of data from the US Bureau of Labor Statistics, Employment Projections, 2023; US Census Bureau, American Community Survey, 2010–22; and US Department of Education, Integrated Postsecondary Education Data System, 2019–21.

Note: We identify metro areas with credentials-to-jobs ratio values below 0.93 as those that will experience credential shortages. We do this to account for estimation error, as some metro areas with ratio values below one may not have credential shortages. When the ratio value falls below 0.93, there is a greater than 95 percent likelihood that a metro area will face a true credential shortage.



**Finding 4: Healthcare is the only occupational group with a nationwide oversupply of credentials that lead to high-paying middle-skills jobs.**

In high-paying middle-skills healthcare occupations, the annual credential supply nationwide exceeds the projected annual demand for workers by 69 percent. This surplus is, in part, a consequence of employers increasingly hiring applicants with a bachelor's degree or higher for high-paying healthcare jobs that have historically been available to middle-skills workers: from 2010 to 2023, the proportion of workers in these healthcare jobs with middle-skills education decreased from 46 percent to 25 percent.<sup>7</sup> If this trend continues, middle-skills workers will make up only 10 percent of the workforce in these occupations by 2032.

We find that only two of the 55 largest metro areas—Philadelphia and Sacramento—have projected credential shortages in high-paying middle-skills healthcare occupations.<sup>8</sup> No evidence suggests that further middle-skills credential production is needed in any of JPMorgan Chase's priority metro areas if the current hiring trend continues (Figure 5).<sup>9</sup>

That being said, the projected demand for middle-skills workers to fill high-paying healthcare occupations conceals overall projected labor shortages in the healthcare workforce over the next several years.<sup>10</sup> For example, researchers have forecast "significant" shortages in the registered nursing workforce based on the anticipated needs of an aging population.<sup>11</sup> These shortages may prompt employers to suspend or reverse the trend toward hiring workers with bachelor's degrees, thereby opening up more opportunities for middle-skills workers. Middle-skills providers can make the case that their graduates are prepared to help address these needs.

---

<sup>7</sup> Employment trends for registered nurses (RNs) are a major driver of this trend. Seventy-two percent of the RN workforce held a bachelor's degree or higher in 2022, largely because most employers (72 percent) prefer to hire workers with a bachelor's degree even though a much smaller proportion (28 percent) require new hires to have a bachelor's degree. American Association of Colleges of Nursing, ["Nursing Workforce Fact Sheet,"](#) 2023.

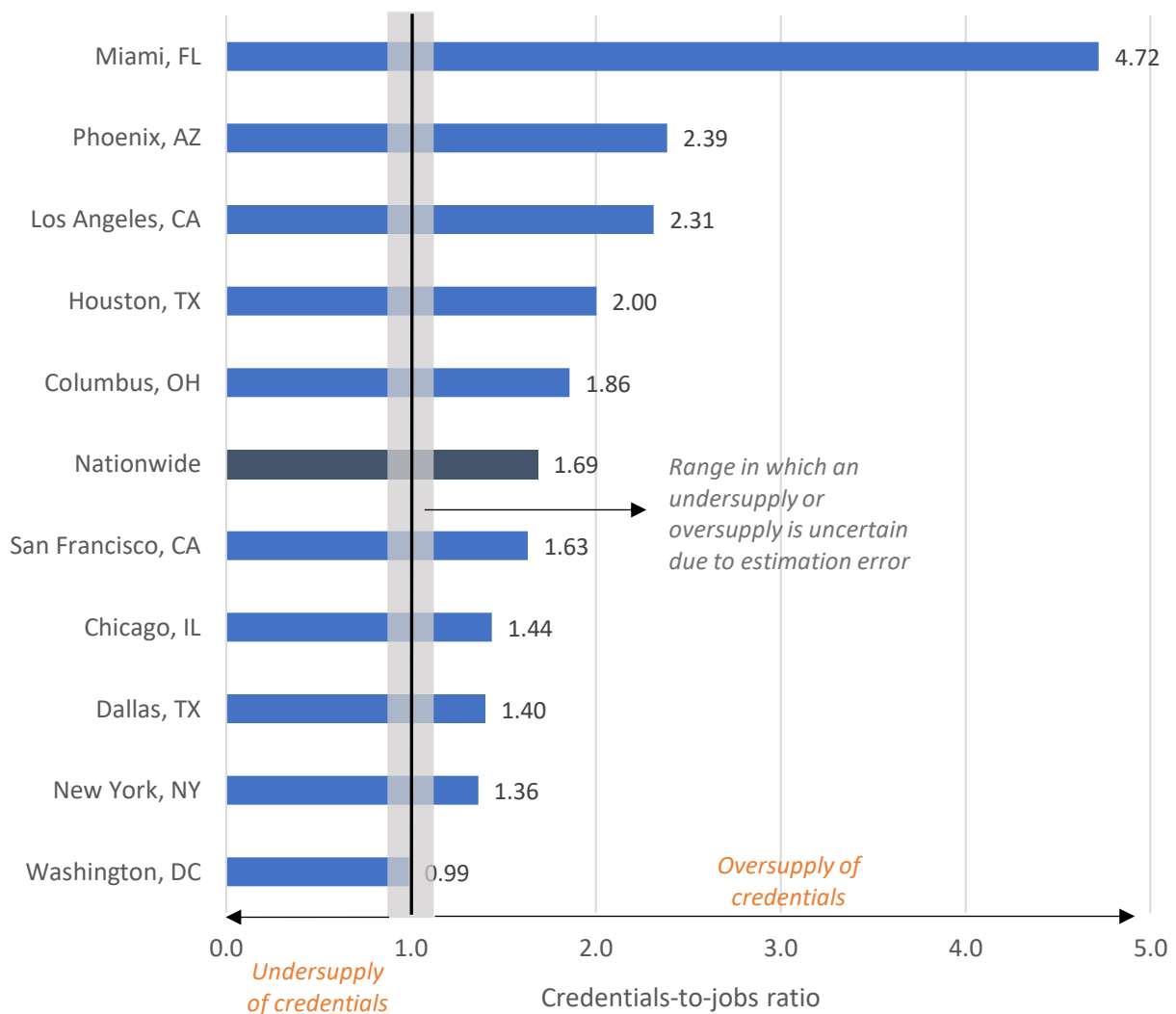
<sup>8</sup> The credentials-to-jobs ratio in Philadelphia and Sacramento is 0.69 and 0.91, respectively.

<sup>9</sup> However, if current hiring trends do not persist and middle-skills workers instead maintain their current representation in high-paying middle-skills healthcare occupations (25 percent), then 11 metro areas would experience a credential shortage, with Washington, DC, being the lone JPMorgan Chase priority metro area on the list. The other metro areas that would experience a shortage are Detroit, Grand Rapids, Kansas City, Minneapolis, Philadelphia, Portland (OR), Raleigh, Rochester, Sacramento, and San Jose.

<sup>10</sup> US Department of Health and Human Services, ["Workforce Projections"](#) (online data tool), accessed March 6, 2024.

<sup>11</sup> Stephen P. Juraschek, Xiaoming Zhang, Vinoth Ranganathan, and Vernon W. Lin, ["United States Registered Nurse Workforce Report Card and Shortage Forecast,"](#) *American Journal of Medical Quality* 34, no. 5 (September/October 2019): 473–81.

**Figure 5. Providers nationwide and in each of JPMorgan Chase’s priority metro areas are producing enough (and often more than enough) credentials in programs aligned to high-paying middle-skills healthcare occupations.**



Source: Georgetown University Center on Education and the Workforce analysis of data from the US Bureau of Labor Statistics, Employment Projections, 2023; US Census Bureau, American Community Survey, 2010–22; and US Department of Education, Integrated Postsecondary Education Data System, 2019–21.

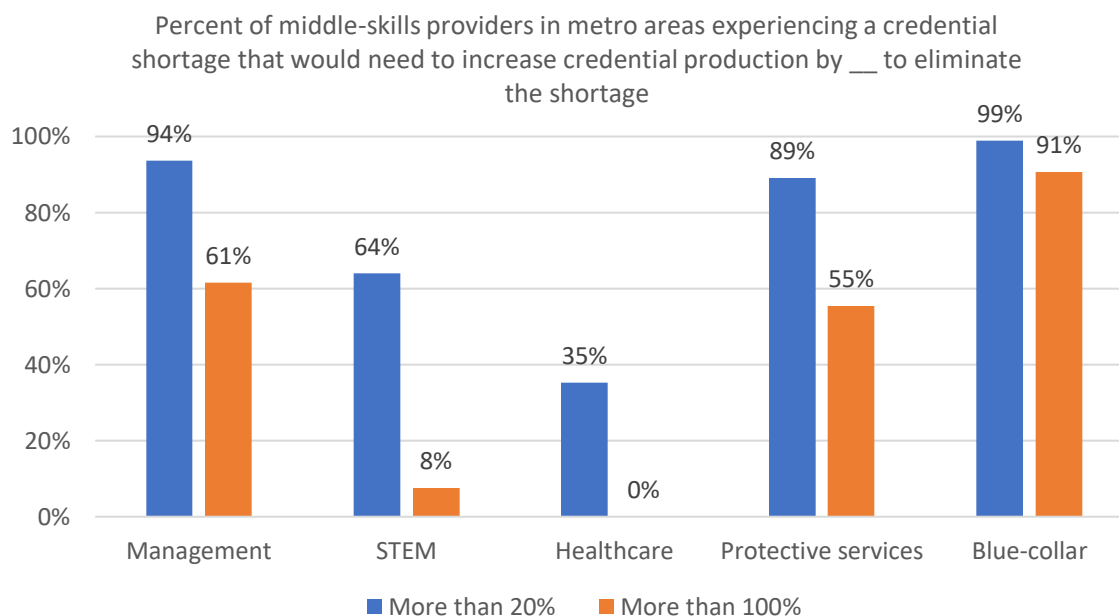
Note: We identify metro areas with credentials-to-jobs ratio values below 0.93 as those that will experience credential shortages. We do this to account for estimation error, as some metro areas with ratio values below one may not have credential shortages. When the ratio value falls below 0.93, there is a greater than 95 percent likelihood that a metro area will face a true credential shortage.

Finding 5: To eliminate local shortages, many providers would need to more than double the number of credentials they award in programs aligned to high-paying middle-skills occupations.

Not all metro areas will face credential shortages in programs aligned to high-paying middle-skills occupations. However, where shortages exist, they tend to be substantial. Consequently, in metro areas that will experience shortages, most providers would need to dramatically expand their credential production to meet the projected demand for middle-skills workers in those occupations.

For example, 343 providers award credentials in programs aligned to high-paying middle-skills blue-collar occupations across the 52 major metro areas that will experience credential shortages in those programs.<sup>12</sup> Among these 343 providers, 311 (91 percent) would need to more than double their credential production in those programs to eliminate the shortage in the local labor market.<sup>13</sup> Likewise, over half of providers in metro areas that will experience credential shortages in programs aligned to high-paying middle-skills management and protective services occupations would need to more than double their credential production in those programs to meet the projected local demand for those workers (Figure 6).

**Figure 6. Over half of providers in metro areas that will face credential shortages in programs aligned to high-paying middle-skills blue-collar, management, and protective services occupations would need to more than double their credential production in those programs to meet local demand.**



<sup>12</sup> In total, our analysis included 1,194 middle-skills providers across all 55 metro areas.

<sup>13</sup> To estimate how much each provider would need to increase its annual credential production to collectively eliminate the metro area's credential shortage, we assume each provider would expand production in proportion to its current production share of credentials aligned with high-paying middle-skills occupations in the metro area.

Source: Georgetown University Center on Education and the Workforce analysis of data from the US Bureau of Labor Statistics, Employment Projections, 2023; US Census Bureau, American Community Survey, 2010–22; and US Department of Education, Integrated Postsecondary Education Data System, 2019–21.

These findings underscore the need for many middle-skills providers to substantially expand their program capacity in high-paying fields. This can occur in two ways, both of which should be pursued. First, middle-skills providers can recruit more individuals without a college degree to their institutions. Second, high schools and middle-skills providers need to offer better career counseling to future and current enrollees, given that students are ultimately responsible for choosing their program of study and too often choose one without fully understanding the financial consequences.<sup>14</sup> Thus, expanding program capacity in high-paying fields will require investments that both increase the overall supply of middle-skills students and direct more students towards programs leading to high-paying middle-skills jobs.

However, even with these investments, current providers will likely struggle to fully address credential shortages in many metro areas. Unmet demand far exceeds most providers' existing credential production in undersupplied labor markets, and capacity constraints likely limit how much each provider can expand its program offerings. Ultimately, we believe that more providers will need to enter the market to eliminate credential shortages in many of the largest US metro areas.

---

<sup>14</sup> Rachel Baker, Eric Bettinger, Brian Jacob, and Ioana Marinescu, ["The Effect of Labor Market Information on Community College Students' Major Choice,"](#) *Economics of Education Review* 65 (2018): 18–30.