

MINNESOTA ECONOMIC

TRENDS



**IMMIGRATION AND
THE ECONOMY**

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Immigrant Workers

While Minnesota has fewer immigrants proportionally than many other parts of the country, foreign-born residents are an increasingly important part of the state economy.

Since 2010, more than half of the state's labor force growth has come from foreign-born workers, according to the cover story by Steve Hine and Cameron Macht in this issue of Trends magazine. Immigrants now account for 10 percent of the total available labor force in Minnesota, up from 7.5 percent one decade earlier. In just 10 years, foreign-born workers in the state jumped from 206,400 to nearly 303,000.

The story says immigrants are critical to Minnesota's economic success, providing a stream of fresh workers at a time when baby boomers are exiting the labor force in large numbers.

While educational and language barriers prevent many immigrants from filling certain jobs, they are already contributing in significant numbers to such occupations as health care support, protective service, food preparation, personal care, and building and grounds maintenance. Manufacturing, administrative support and waste management services are among the industries where foreign-born workers are often found.

Immigrants have proven to be steady and reliable contributors to the Minnesota economy. With the labor market expected to tighten even more in coming years, it will be critically important to help these new Americans find a place in our society and to succeed in the workplace. Our future depends on it.

Monte Hanson
Editor

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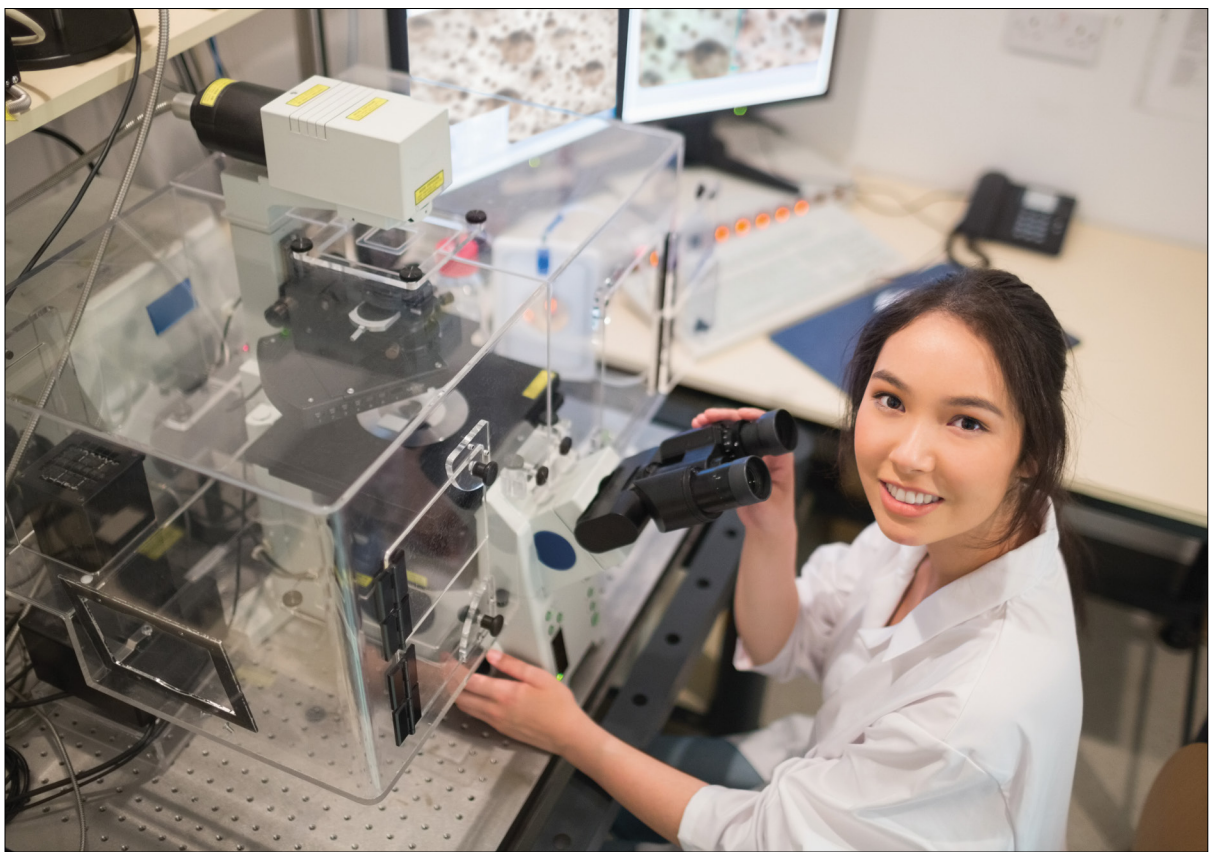
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Immigrants and the Economy

In a tight labor market, immigrants are a vital source of talent for Minnesota employers. Foreign-born workers now account for 10 percent of the state's labor pool.



Increasingly tight labor markets and a growing scarcity of workers are now recognized as two of Minnesota's most significant barriers to sustained economic growth. In the face of these constraints, it has become increasingly evident that

immigration has been and will continue to be a vital source of the workforce that employers need to succeed in the state.

After averaging a net gain of just over 40,000 additional labor force participants per

year between 1976 and 2000, Minnesota employers could easily tap into a large and growing pool of talented workers. From 2000 to 2016, however, our growth in available workers dropped to less than one-third that, at just over

11,000 new workers per year (see Chart 1).

Recently released labor force projections from the Minnesota State Demographic Center suggest this growth will fall further in the years ahead, to an annual average of just over 7,000 additional labor force participants per year between now and 2030. This will make it more challenging for employers to grow, but will also shine a light on the importance of immigration.

Since 2010, the foreign-born labor force in Minnesota has increased by 56,200 people (23 percent growth), while the native-born labor force has increased by 44,400 (1.6 percent

growth). This means that more than half of our recent labor force growth has been driven by immigrants. And this will certainly continue to be the case, with immigrants displaying a much younger age profile than the native-born population, which is aging rapidly and exhibiting lower labor force participation rates as retirement picks up.

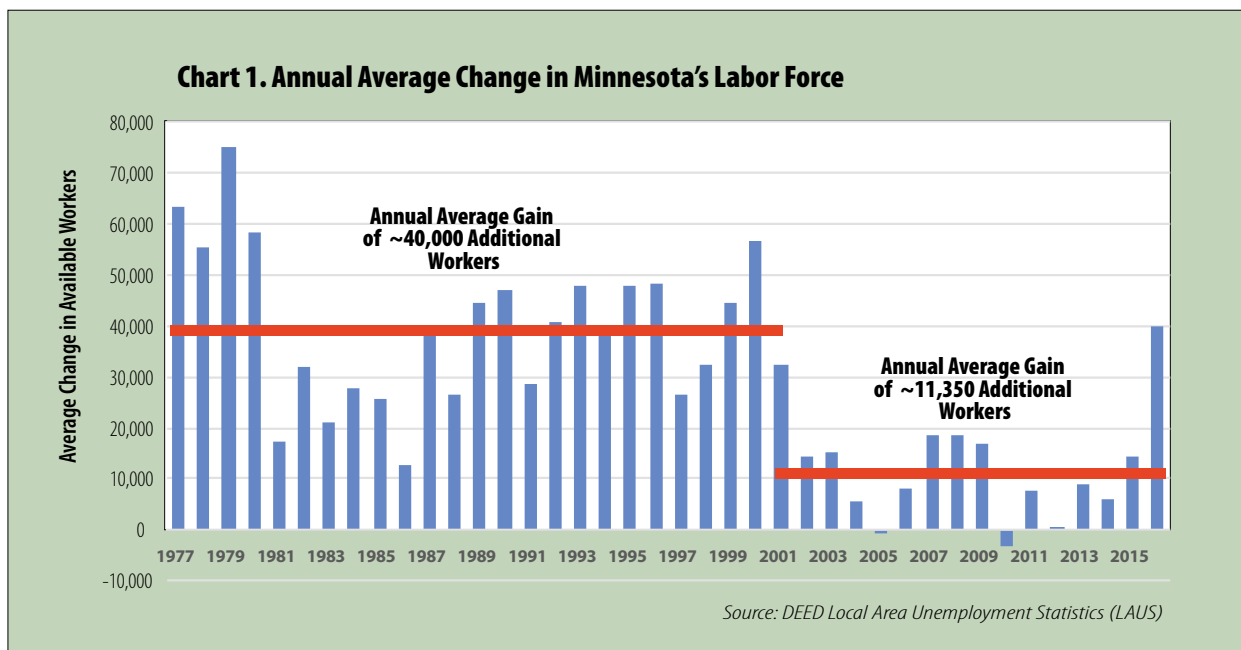
This article reviews immigration trends to Minnesota, as well as the characteristics of these new Minnesotans. In light of possible restrictions on immigration to the U.S., it is important to understand historical trends and reflect on the possible consequences to Minnesota's labor market and economy.

The primary data source for this article is the American Community Survey.

Getting Right to Work

Immigrants have become critical to Minnesota's economy, providing a rapid stream of new workers in the face of an aging native-born workforce. Foreign-born workers now account for 10 percent of the total available labor force in Minnesota, up from 7.5 percent just one decade earlier. In sum, the number of foreign workers jumped from 216,409 in 2006 to 302,879 in 2016.

Minnesota's labor force increased by just over 150,000 workers from 2006 to 2016, a steady 5.2



percent expansion. More than half – 86,470 or 58 percent – of those workers were foreign born. Put another way, the foreign-born labor force expanded by 40 percent from 2006 to 2016, compared with 2.4 percent growth among the native-born workforce.

While labor force participation rates were declining for native-born workers, they were increasing for foreign-born workers. Participation rates were around 71 percent for both groups in 2006, but dropped to 69.1 percent for native-born workers by 2016 and rose to 72.7 percent for foreign-born workers (see Table 1).

Barriers to Entry

According to the American Community Survey, Minnesota is now home to more than 450,000 foreign-born residents, or about one in every 12 people. Of those, 43.7 percent entered the U.S. before 2000, 31.6 percent came between 2000 and 2009, and the remaining 24.6 percent settled in Minnesota since 2010. That made Minnesota’s foreign-born population “newer” than in the rest of the United States, where 54.7 percent entered prior to 2000 and just 18.6 percent entered since 2010 (see Chart 2).

One challenge to assimilating

into a new culture is language, but many new Minnesotans have made headway. About 81 percent of foreign-born residents in Minnesota speak a language other than English, but many of them can also speak English. About 45.3 percent reported they speak English less than “very well,” compared with 49.1 percent of foreign-born residents nationwide.

Perhaps surprisingly, a notable portion of Minnesota’s foreign-born population is well educated, with about one-third (32.6 percent) of foreign-born adults age 25 and over holding a bachelor’s degree or higher, which is right in line with

Table 1. Labor Force Characteristics of the Native and Foreign Born Population in Minnesota

				2006-2016 Change		2011-2016 Change	
	2006	2011	2016	Number	Percent	Number	Percent
Native Born							
Population 16 and Over	3,754,283	3,855,411	3,959,481	205,198	5.5%	104,070	2.7%
In Labor Force	2,673,049	2,702,643	2,736,001	62,952	2.4%	33,358	1.2%
Participation Rate	71.2%	70.0%	69.1%	-2.1%		-0.9%	
Employed Workers	2,534,141	2,498,306	2,637,014	102,873	4.1%	138,708	5.6%
Unemployed	136,326	202,698	98,496	-37,830	-27.7%	-104,202	-51.4%
Unemployment Rate	5.10%	7.50%	3.60%	-1.5%		-3.9%	
Foreign Born							
Population 16 and Over	304,802	355,053	416,042	111,240	36.5%	60,989	17.2%
In Labor Force	216,409	254,573	302,879	86,470	40.0%	48,306	19.0%
Participation Rate	71.0%	71.7%	72.7%	1.7%		1.0%	
Employed Workers	202,693	229,719	285,405	82,712	40.8%	55,686	24.2%
Unemployed	13,417	25,203	17,264	3,847	28.7%	-7,939	-31.5%
Unemployment Rate	6.2%	9.9%	5.7%	-0.5%		-4.2%	

Source: U.S. Census Bureau, American Community Survey 1-Year Estimates

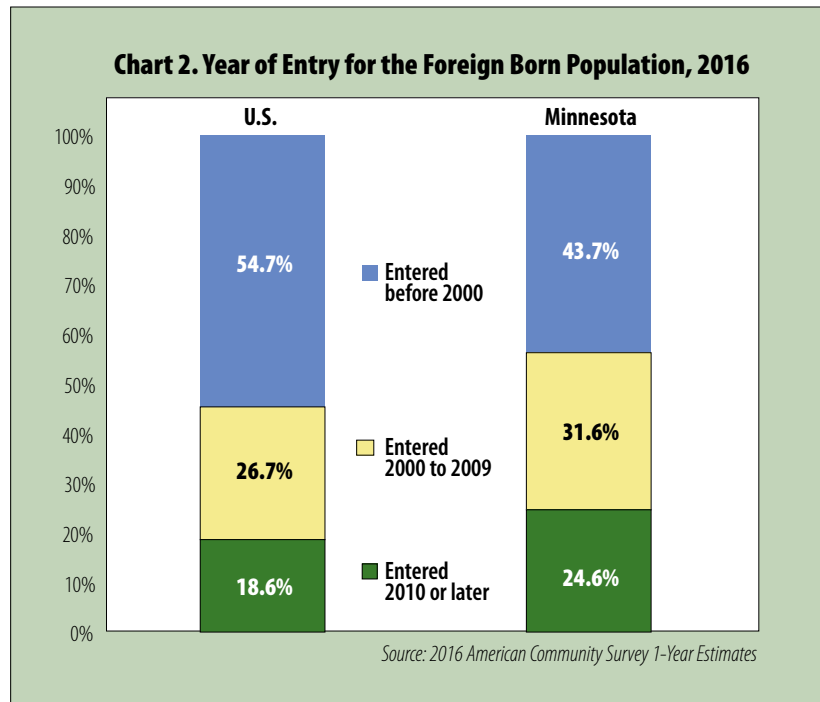
native-born Minnesotans (35 percent). In each case, Minnesota was above the comparable educational attainment levels for both foreign- (30 percent) and native- (31.6 percent) born residents nationwide.

It is equally important, however, to note that nearly half (45.8 percent) of foreign-born Minnesotans have a high school diploma or less, including 27.1 percent that are not high school graduates. That compared with just 30.8 and 4.9 percent of natives, respectively.

For foreign-born residents who were not U.S. citizens, this jumps to 52.7 percent with a high school diploma or less, including 34.4 percent without a high school diploma. This is a sizeable number and shows that many immigrants need access to education to be prepared for the workforce, where jobs for high school graduates are increasingly difficult to fill.

Another big gap between native-born and foreign-born is in the percentage of residents who have attended some college or earned an associate degree. Just over 34 percent of native-born Minnesotans have some college or an associate degree, compared with just 21.6 percent of foreign-born Minnesotans and just 15.5 percent of foreign-born non-citizens.

Chart 2. Year of Entry for the Foreign Born Population, 2016



Service Specialization

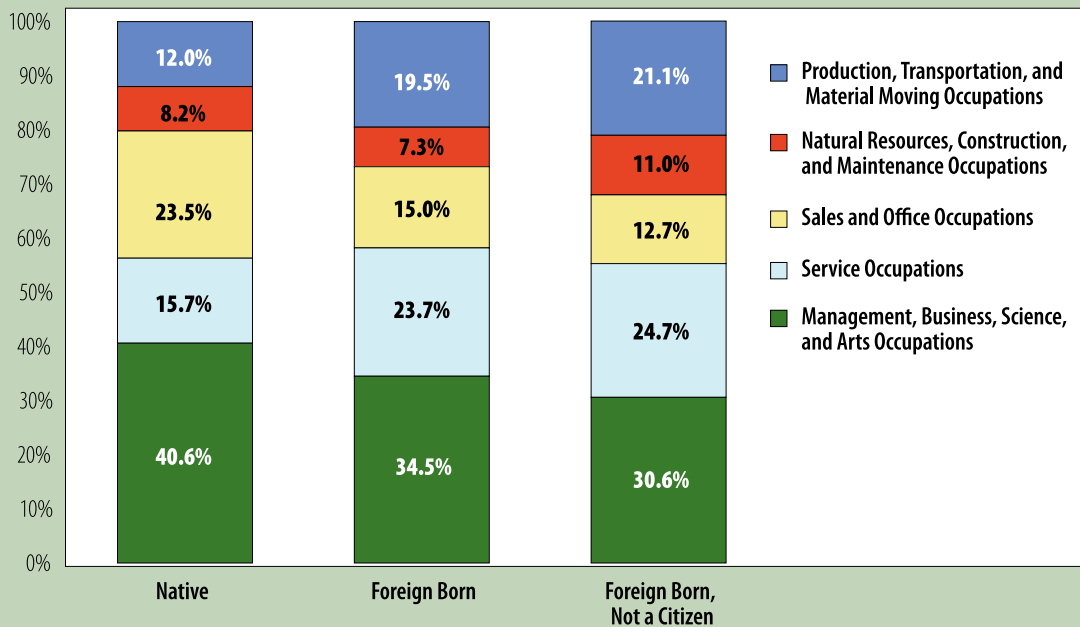
Perhaps in part due to the language and educational barriers described, foreign-born workers were much more likely to work in certain occupational and industry groups than native-born workers. For example, native-born workers were 8.5 percentage points more likely to work in sales and office occupations than foreign-born workers, and 6.1 percentage points more concentrated in management, business, science and arts occupations.

In contrast, foreign-born workers were found more often in service occupations, which include health care support, protective service, food preparation and serving, building and grounds cleaning, and personal care occupations. They were also much more concentrated in production, transportation and material moving occupations. These gaps are even more pronounced for foreign-born workers who are not citizens, who presumably have entered more recently (see Chart 3).

By industry, foreign-born workers were much more likely to be found working in manufacturing, administrative support and waste management services – which includes temporary staffing services – and leisure and hospitality. In contrast, immigrants were less likely to be employed in retail trade, public administration, construction, and finance, insurance and real estate.

Not surprisingly, some detailed occupations have very high shares of foreign-born workers

Chart 3. Occupation of Employment for Minnesota Workers by Place of Birth and Citizenship Status, 2016



Source: U.S. Census Bureau, 2016 American Community Survey 1-Year Estimates

(see Table 2). Some of these occupations are already showing critical workforce shortages in Minnesota, including nursing, psychiatric, home health and personal care aides, as well as computer and construction-related occupations. Understanding which industries and occupations our foreign-born workers disproportionately support becomes even more crucial with recent overtures to restrict immigration.

Wherever they work, these new Minnesotans are a vital part of the state's economy, providing rapid growth to an otherwise aging and slowing labor force. In the years ahead, it is likely that labor force constraints will require that every employer consider our young and growing immigrant population as a source of the workforce they will need.

Diminished labor force growth has been obvious in recent years, and it is expected to fall further in the years ahead. Job growth will be constrained by the lack of an available workforce, especially in areas of Greater Minnesota that also have a lower share of both immigrants and minorities. And even with success in attracting new workers, we might not have all the workers that employers will need. Hence, we should also take steps to ensure that we're making the most of

Table 2.
Top Occupations Employing Foreign Born Workers in Minnesota, 2015

Occupation	Foreign Born Employment	Foreign Born Share of Employment
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	10,880	16.7%
Cooks	10,272	18.8%
Miscellaneous Assemblers and Fabricators	9,624	26.4%
Nursing, Psychiatric and Home Health Aides	8,710	15.4%
Personal Care Aides	7,930	18.4%
Software Developers, Applications and Systems Software	7,622	30.3%
Maids and Housekeeping Cleaners	7,064	26.2%
Postsecondary Teachers	6,261	19.3%
Miscellaneous Agricultural Workers	4,949	17.9%
Biomedical Engineers	4,847	22.3%
Hand Packers and Packagers	4,546	35.8%
Physicians and Surgeons	3,929	22.0%
Packaging and Filling Machine Operators and Tenders	3,249	38.0%
Computer Programmers	2,942	23.0%
Miscellaneous Media and Communication Workers	2,835	63.6%
Miscellaneous Personal Appearance Workers	2,726	64.2%
Butchers and Other Meat, Poultry, and Fish Processing Workers	2,646	39.5%
Computer and Information Systems Managers	2,598	16.8%
Computer Systems Analysts	2,498	17.8%
Taxi Drivers and Chauffeurs	2,093	31.3%
Roofers	1,775	30.7%

Source: 2011-2015 American Community Survey 5-Year Estimates

the workers we have by removing frequent impediments to work.

Minnesota's immigrant population has been a crucial source of the workforce our state needs to continue to grow, and this is only expected to intensify in the years ahead. It is critically important, therefore, that we

take steps to reduce any barriers that our foreign-born residents face in fully participating in our labor markets. Only by doing so can we hope to continue the economic success that our state has been known for. ■

Job Polarization

Jobs are growing at a steady pace in low- and high-wage fields in Minnesota, but many middle-wage occupations are stagnant or shrinking, particularly in rural Minnesota.

Minnesota had 2.8 million wage and salary jobs in 2016, with half of the jobs paying from \$26,420 to \$62,570 per year, according to wage data from the Occupational Employment Statistics (OES) program.¹ Another quarter of jobs were in occupations that paid less than \$26,420 (the 25th percentile) annually, while the remaining quarter of jobs paid above \$62,570 (75th percentile) per year. That wage distribution, which changes from year to year, applies only to last year.

The big question is how has employment distribution by wage or skill-level shifted over time? Has job growth occurred faster in low-wage occupations than in middle- and high-wage positions? An equally important question is how have the pay differences between low-, middle-, and high-wage occupations shifted? Are high-wage occupations making relatively more than middle- and low-wage jobs now than 10 years ago?

Most of the relevant research has concluded that employment in

low- and high-wage occupations has expanded at a faster clip than employment in middle-wage jobs in the U.S. The shift has been going on for over three decades and appears to speed up during recessions, when job loss is concentrated in middle-wage occupations.

The widening wage gap between high-wage and low-wage jobs over time also has been confirmed.

These two key labor market developments have come to be known as “job polarization,” which has been documented in the United States and across most other developed countries. The two most common explanations for the concentration of employment growth in high- and low-wage occupations are technological advancements and globalization. Another factor that receives less attention is the ongoing shift in the mix of goods and services demanded by consumers.

Increasing use of information technology across almost all industries has increased the

demand for highly-skilled, highly-paid workers, while decreasing the demand for workers who perform routine tasks.

Many jobs in the office and administrative support occupational group involve routine work. Many of the routine tasks have been automated with information technology, leading to office and administrative support employment tailing off by 9 percent between 1999 and 2016 in Minnesota. Computer and mathematical occupational jobs, on the other hand, have surged by 39 percent since 1999 in the state.

Production jobs – found primarily in manufacturing industries – have declined by 9 percent over the same period in Minnesota, due to a combination of technological advancement and globalization. The percent of manufacturing jobs lost due to automation and increasing productivity as opposed to offshoring remains a widely-debated topic, as shown in last year’s presidential election.

¹Minnesota Occupational Employment Statistics wage data are available at <https://mn.gov/deed/data/data-tools/oes/>.

U.S. consumers, including Minnesota households, are increasing their consumption of services at a faster pace than their consumption of goods. Goods production disproportionately employs middle-skilled employees, while services tend to employ high-skilled and low-skilled workers who interact personally with consumers.

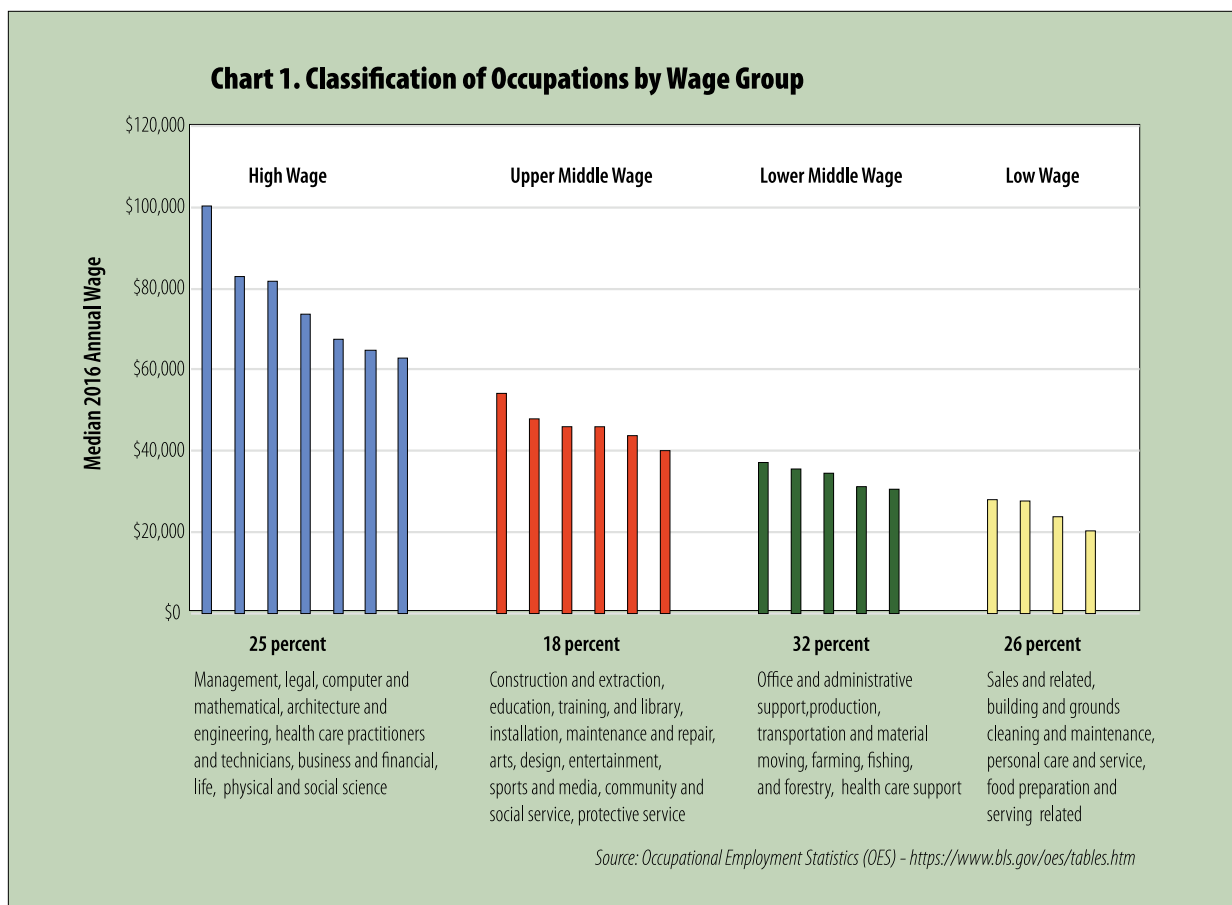
Minnesota employment in health care practitioner and technical occupations (high-wage jobs) has increased 36

percent over the last 17 years, while personal care and service occupations (low-wage jobs) have more than doubled over the same time according to OES data.

Employment and median annual wages across 22 major occupational groups from the Occupational Employment Statistics program are utilized here to examine job polarization in Minnesota and to determine if the wage mix of Minnesota’s employment growth differs from the national picture.

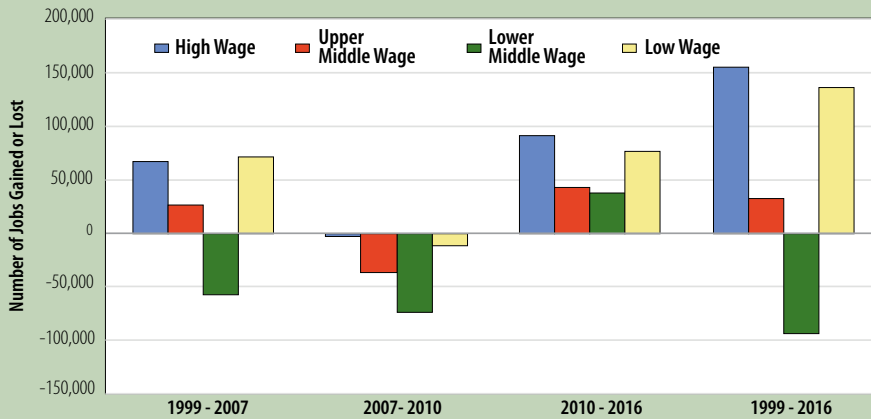
Employment is divided into four wage groups based on 2016 median annual wages for 22 major occupational groups.² The major groups in each wage level are shown in Chart 1 along with median group wages and the percent of employment accounted for by each wage level in 2016. Wage and skill levels are highly correlated, so the wage groups can also be viewed as skill level categories.

The seven occupational groups that had median annual wages above \$62,840 in 2016 are



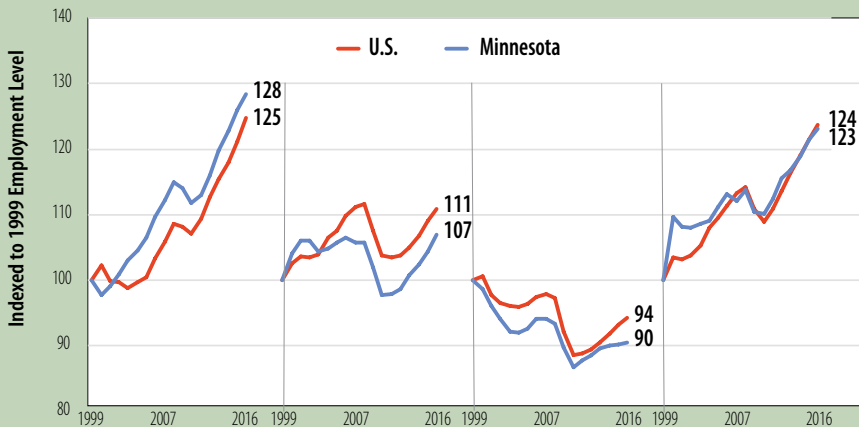
²The 1999–2016 Occupational Employment Statistics data used in the analysis can be found at <https://www.bls.gov/oes/tables.htm>.

Chart 2. Share of Employment Shifts by Occupational Wage Groups, Minnesota, 1999 to 2016



Source: Occupational Employment Statistics (OES) - <https://www.bls.gov/oes/tables.htm>

Chart 3. Job Growth by Wage Group, 1999 - 2016



Source: Occupational Employment Statistics (OES) - <https://www.bls.gov/oes/tables.htm>

combined into the high-wage group. The upper middle-wage group includes employment in six major occupational groups, with 2016 annual median wages ranging from \$54,190 to \$40,100. The lower middle-wage group, with five major groups, had median annual wages from \$37,180 to \$30,600. The low-wage group consists of four occupational groups, all with annual median wages below \$28,030.

Analysis of employment shifts across the four wage groups during four periods from 1999 to 2016 clearly shows job polarization occurring in Minnesota (see Chart 2). The majority of job growth between 1999 and 2007 occurred in either high- or low-wage occupations. Employment in lower middle-wage occupations fell, even though total employment rose. During the recession, all wage levels lost jobs, but cutbacks were smallest among high- and low-wage occupations and highest in upper and lower middle-wage occupations. Job loss was especially steep in lower middle-wage occupations.

Over the last six years, Minnesota has added 248,000 jobs across all wage levels, but considerably more jobs have been added in high- and low-wage occupations than in upper and lower middle-wage occupations. Upper middle-wage job growth

has been high enough since the recession to recover jobs lost during the recession, but the 37,350 jobs added in lower middle-wage occupations since the recession are far short of the 73,830 jobs lost during the recession.

Over a longer time period (the last 17 years), employment in lower middle-wage occupations is the only group to have declined. Upper middle-wage employment expanded, but the increase was far below employment expansion in high- and low-wage occupations.

Minnesota, like the nation, has been creating jobs over the last two decades, but job growth has been concentrated at the high and low ends of the wage range. Other states where job polarization has been documented include New York, New Jersey, Oregon, Missouri, Arkansas, Kentucky, Illinois and Tennessee.³

The wage mix shift of job growth in Minnesota has been similar to the nationwide shift (see Chart 3). Employment in high-wage occupations in Minnesota has increased 28 percent compared with 25 percent nationally since 1999. Employment in low-wage

occupations has increased 23 percent in Minnesota, compared with 24 percent nationally. Minnesota's employment growth in middle-wage occupations has fallen slightly short of the national pace.

Employment in lower middle-wage occupations has decreased in Minnesota and nationally since 1999. Health care support occupations are the only jobs among the five major occupational groups included in the lower middle-wage group that have increased. Employment in the other four major groups – production, office and administrative support, transportation and material moving, and farming, fishing and forestry – have all declined in Minnesota.

Lower middle-wage occupations have slipped by 6.5 percentage points from 38.2 percent of employment in 1999 to 31.7 percent in 2016 in Minnesota. Nationally the share of lower middle-wage occupations has dropped 5.5 percentage points from 37.8 percent to 32.3 percent over the same span.

Job polarization appears to be occurring across all areas of the state, but not necessarily

uniformly (see Chart 4). The same categorization of major occupational groups into four wage levels as used previously on state and national level occupational data was applied to county-level occupational data after combining Minnesota counties into three groups – Twin Cities Metro (10 counties), Greater Minnesota Metro (11 counties) and Greater Minnesota Rural (66 counties).⁴

The fastest-growing wage group was the high-wage occupational group in all three areas between 2009 and 2015.⁵ Low-wage occupation employment was the second fastest-growing wage group across each area. The slowest-growth wage group was lower middle-wage occupations in Greater Minnesota Metro and Greater Minnesota Rural, while upper middle-wage occupations were the slowest growing in the Twin Cities Metro. Total employment declined in Greater Minnesota Rural, with only employment in high-wage occupations expanding in that region.

The job polarization trend identified here is a major source of the rise in income inequality, since wage income is the main source of income for most

³Here are links to job polarization research in the other states: <https://www.stlouisfed.org/publications/regional-economist/second-quarter-2017/labor-market-polarization-how-does-the-district-compare-with-the-nation>, https://www.newyorkfed.org/medialibrary/media/research/current_issues/ci18-7.pdf, <https://oregoneconomicanalysis.files.wordpress.com/2013/10/oregon-job-polarization.pdf>.

⁴The Twin Cities Metro consists of 10 counties: Anoka, Carver, Chisago, Dakota, Hennepin, Ramsey, Scott, Sherburne, Washington and Wright. Greater Minnesota Metro consists of 11 counties: Benton, Blue Earth, Carlton, Clay, Dodge, Houston, Nicollet, Olmsted, Polk, St. Louis and Stearns. The other 66 counties make up Greater Minnesota Rural.

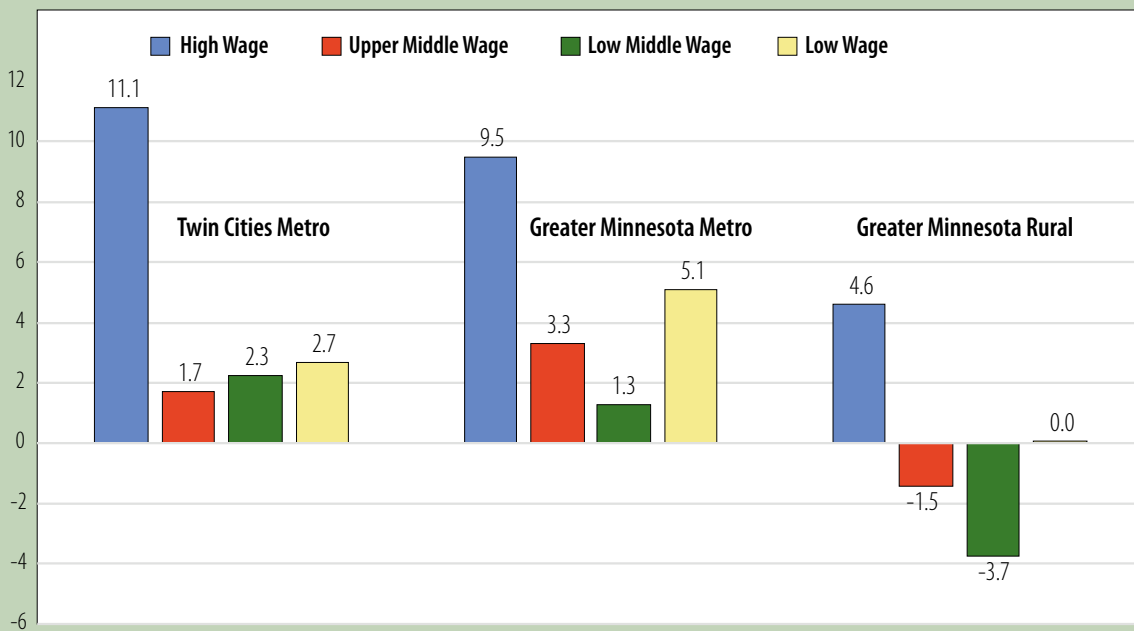
⁵Five-year estimates of county level occupational employment by major group compared data for the 2005-2009 and the 2011-15 estimates.

households. Technological advances and globalization forces are unlikely to ease in the future, so job polarization is likely to continue, with new jobs being generated at the high and low extremes of the wage distribution. Middle-wage occupations are likely to continue to grow slower or even decline, which means displaced workers need to be trained with the skills to match the shifting employment picture.

This analysis brings up two important topics for future research. One topic that should be explored is matching up the education and training required to better match the type of jobs being created. A second topic is measuring the increasing wage gap between occupations requiring higher skills and those requiring fewer skills. Neither of these components of job polarization was covered in this article.

Keep in mind, though, that upper and lower middle-wage occupations still account for the majority of employment and thus the majority of job opportunities. This means that education and training programs should also include middle-skilled training. Employment may be growing the fastest in high- and low-skilled occupations, but the majority of openings will continue to occur in the middle-skilled occupations. ■

Chart 4. Regional Share of Employment Shifts by Occupational Wage Groups, 2009 to 2015, 5-Year Estimates



Source: American Community Survey, 2005-2009 and 2011-2015 5-year estimates.
Table C24010 - Sex by Occupation for the Civilian 16 Years and Over.

Breaking Down the Gender Earnings Gap

For a variety of reasons, including gender bias, women earn 28.3 percent less than men in health care and social assistance jobs.

Women earn 15 percent less than men in Minnesota, according to data from the 2015 American Community Survey (ACS). Industry breakdowns reveal that women's median earnings are lower than men's in all 20 aggregated industries in Minnesota. Women earn less than men even when comparing women and men who work in the same industry for the same number of hours.

This article examines health care and social assistance jobs in Minnesota, an industry sector where women far outnumber men and where we might expect little or no gender pay gap. In fact, men still earn more than women even in these predominately female workplaces.

Both uncontrolled annual earnings of women and men are compared, as well as earnings after controlling for age, education and hours of work. Gender earnings gaps by detailed industry and occupations within health care and social assistance also are examined.

Sector Overview

With a gross domestic product (GDP) of \$30 billion in 2015, health care and social assistance accounted for 9.2 percent of Minnesota's GDP, making this the fifth-largest industry sector in the state by this measure, according to the Bureau of Economic Analysis.



Health care and social assistance is the largest employer in Minnesota. In 2015, this sector alone employed more than 462,778 people, which accounted for 17 percent of Minnesota's employed workers, according to the Quarterly Census of Employment and Wages. DEED's long-term projections indicate the sector is expected to grow by 17.4 percent between 2014 and 2024, making it the fastest-growing industry in Minnesota.

More than one-quarter of all full-time working women in Minnesota are employed in health care and social assistance, making it the leading employer of women. Over 78 percent of full-time workers in the sector are women. All of its 15 detailed industries are dominated by women, and the share of women is as high as 94.1 percent in child day care services.

In 2015, 65 percent of workers employed in health care and social assistance usually worked 35 hours or more per week and had median annual earnings of \$40,000. The unemployment rate for workers 16 or older in this sector was 1.9 percent in 2015. Educational attainment of full-time workers in the sector shows the following breakdown: associate degree (16.5 percent), bachelor's degree (26 percent), master's degree (8.7 percent), professional degree beyond

bachelor's (7.5 percent) and doctoral degree (3.3 percent).

Among full-time workers, median annual earnings, not controlled for demographic factors, were \$52,000 for men and \$37,300 for women, for an earnings ratio of 71.7 percent. Put simply, women make 28.3 percent less than men in this sector.

Unpacking the Earnings Gap

One factor in women's lower earnings is that they tend to work fewer hours than men. In health care and social assistance, the median full-time work schedule is 40 hours per week for both women and men, while the average hours of work is 44.8 hours for men and 42.3 hours for women.

Since more hours of work can be expected to increase earnings and since men have more hours of work than women, it makes sense then to compare earnings after controlling for hours of work. The median gender earnings ratio after controlling for hours of work improves from 71.7 percent to 85 percent, with the gender earnings gap dropping from 28.3 percent to 15 percent (see Chart 1). This suggests that about one-half of the gender earnings gap between men and women is due to fewer hours of work by women.

Educational Attainment

Educational attainment is another characteristic that may drive earnings gaps, with more education usually commanding higher earnings. If men have more education than women in this sector, then the uncontrolled earnings gap of 28.3 percent should go down after controlling for education.

Men do have more education than women in health care and social assistance: 58.6 percent of women and 73 percent of men have at least an associate degree; 4.1 percent of women and 18.6 percent of men have a professional degree beyond a bachelor's degree; and 2.3 percent of women and 6.2 percent of men have a doctoral degree.

However, after controlling for five levels of education ("no college degree" is the base category against which the other award levels are compared), the gender earnings ratio, instead of improving, actually worsens to 51.3 percent.

This suggests that women and men employed in health care and social assistance are rewarded differently for the same educational attainment. Chart 2 shows the sectoral average increases in wage and salary income by award level, after controlling for hours of work and

age. At all levels of education, men receive a higher salary premium than women, with the gap increasing as the degree level increases.

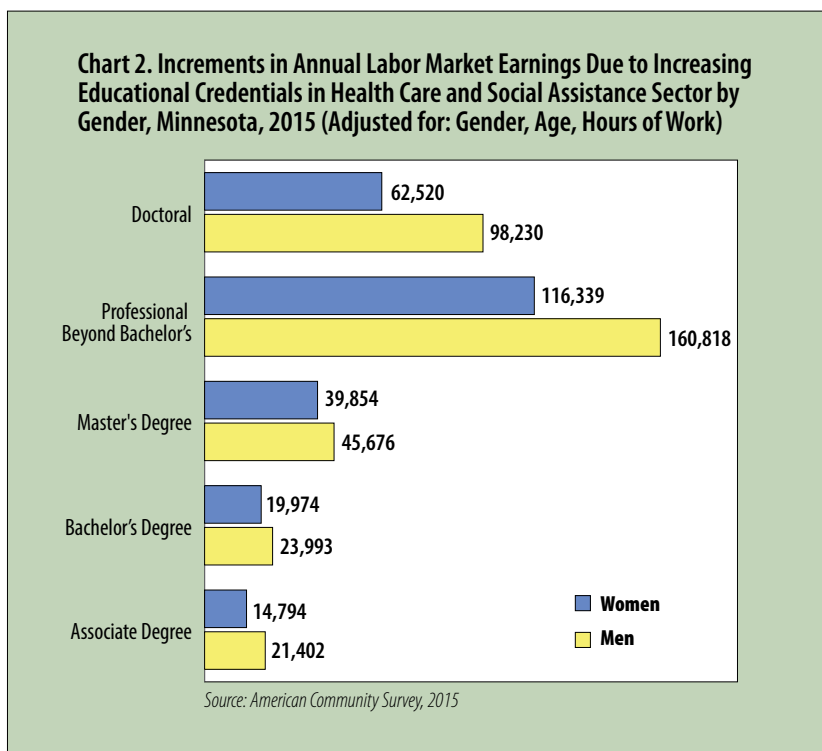
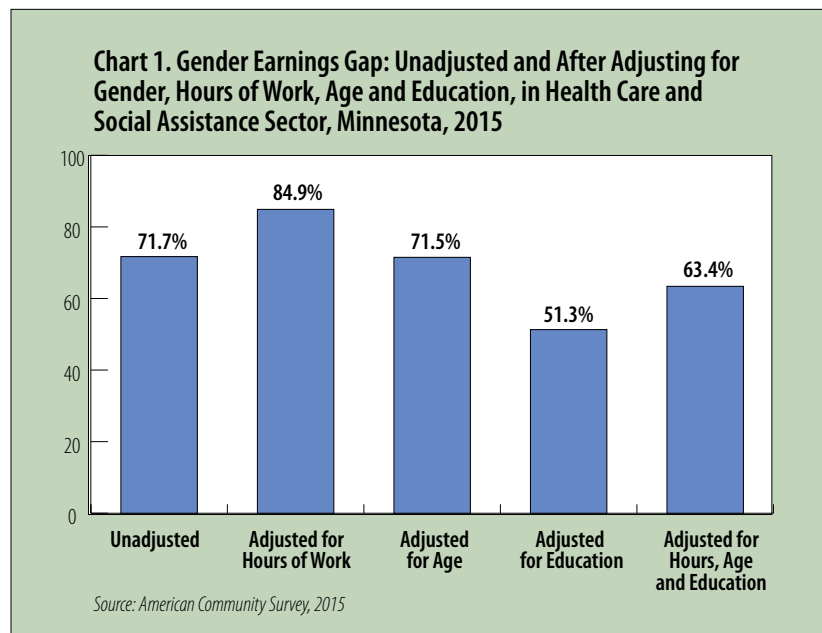
To summarize, although women have less education than men in this sector, the gender earnings ratio, after controlling for education, actually worsens. This suggests that at the same education level, women are paid less than men. This gendered differential in earnings at the same level of education is potentially a major contributor to the overall earnings gap.

Hours of Work, Age and Educational Attainment

Finally, using both hours and education as controls, with age as a proxy variable for work experience, the gender earnings ratio stands at 63.4 percent (see Chart 1). This suggests that hours of work and educational attainment are key economic variables associated with the overall gender earnings ratio in this sector.

Dissimilarity in Distribution Across Detailed Industries

One commonly cited cause of the gender earnings gap is that women and men might work in industries that pay differently. If women are concentrated in lower-paying industries and men



in higher-paying ones, this could be a significant factor driving the overall earnings gap. In Table 1, we can see in the second and third columns women are more concentrated in lower-paying industries, including child day care services and skilled nursing facilities, while men are more concentrated in higher-paying industries, including hospitals and offices of physicians.

One can assess the impact of dissimilarity in the distribution of women and men across detailed industries on the overall earnings gap through a hypothetical exercise of re-distributing women between sectors until their distribution is identical to that of men. As an example, if some women were moved from lower-paying child day care services into higher-paying hospitals, then

their earnings would increase from \$15,000 to \$50,000. Similar shifts between detailed industries to achieve parity in distribution could potentially close a substantial proportion of the overall earnings gap.

Earnings Gap Within Detailed Industries

A sharp difference in median earnings exists between genders

Table 1. Distribution, Earnings, and Earnings Gaps by Detailed Industries in Health Care and Social Assistance Sector, Minnesota, 2015

Sub-sectors in Health Care and Social Assistance	Distribution of Men (%)	Distribution of Women (%)	Share of Women (%)	Median Annual Earnings Women	Median Annual Earnings Men	Male to Female Wage Gap (%)
Child Day Care Services	1	9	95.4	\$15,000	\$9,000	-66.7
Vocational Rehabilitation Services	2	2	74.5	\$25,000	\$46,700	46.5
Residential Care Facilities, except Skilled Nursing Facilities	7	8	78.0	\$28,000	\$31,500	11.1
Home Health Care Services	3	5	84.0	\$29,200	\$32,000	8.8
Individual and Family Services	8	10	79.5	\$30,000	\$38,000	21.1
Nursing Care Facilities; Skilled Nursing Facilities	5	10	86.9	\$33,500	\$25,600	-30.9
Community Food and Housing, and Emergency Services	1	1	75.6	\$35,000	\$60,000	41.7
Offices of Other Health Practitioners	1	1	75.2	\$40,000	\$130,000	69.2
Offices of Physicians	6	4	68.6	\$40,000	\$181,000	77.9
Other Health Care Services	9	3	54.5	\$40,000	\$61,000	34.4
Offices of Dentists	3	3	75.8	\$42,000	\$120,000	65.0
Outpatient Care Centers	14	12	73.4	\$44,500	\$50,000	11.0
Hospitals	38	32	72.9	\$50,000	\$62,000	19.4
Office of Chiropractors	1	0	58.2	\$55,000	\$84,000	34.5
Offices of Optometrists	1	0	60.5	\$56,000	\$100,000	44.0
Total	99	91	76.2	\$37,300	\$52,000	28.3

Source: American Community Survey, 2015

within subsectors, suggesting that this is an important factor driving the overall gender earnings gap. Depending on the detailed industry, the median earnings differ widely for women and men, with the gender gap ranging from 22.1 percent in offices of physicians to 166.7 percent in child day care services.

Generally, men massively out-earn women in the highest-paying detailed industries, while women out-earn men in the lowest-paying detailed industries.

Men out-earn women in offices of physicians, other health practitioners, dentists, vocational rehabilitation services, optometrists, chiropractors, and community food, housing and emergency services. Men also out-earn women in individual and family services, hospitals, residential care facilities, outpatient care centers and home health care services.

Women, meanwhile, out-earn men by wide margins in skilled nursing facilities and child day care services. Both these sectors, however, have some of the lowest annual earnings.

Occupational Dissimilarity

There is some evidence that dissimilarity in occupational distribution can also help to explain the gender earnings



gap (see columns 2 and 3 of Table 2). Earnings are lower in occupational groups in which women are concentrated, including health care support (\$30,000), office and administrative support (\$35,400) and personal care and service (\$20,000).

Men, on the other hand, tend to be concentrated in health care practitioners and technical occupations, where the median salary is much higher at \$89,000.

Within Occupation Earnings Gaps

Within-occupation wage and salary figures are starkly inequitable, with women earning less than men in all but six

occupations (see Table 2). The gender ratio ranges from a low of 67.4 percent (earnings gap of 32.6 percent) in health care practitioners and technical occupations to 84.1 percent (earnings gap of 15.9 percent) in office and administrative support. Women out-earn men in six occupational groups, including health care support and community and social services. Less than a quarter of women, however, are employed in the occupational groups where they out-earn men.

To further examine this within-occupation earnings gap, consider the occupational group health care practitioners and technical. Thirty-three percent of women and 46 percent of

men in the health care and social assistance sector work in jobs in this occupational group. Men out-earn women by 32.6 percent in this occupational group. Within *detailed occupations* in this group, the most popular choice for men is physicians and surgeons (35 percent), while only 7.3 percent of women opt for this occupation. The most

popular choice for women, on the other hand, is nursing, with 53.3 percent of women choosing a nursing occupation but less than a quarter of men.

Choices Matter

Occupational choices matter when it comes to earnings. Almost 50 percent of men are

in health care practitioner and technical occupations that pay a median salary of \$100,000 or more. Only 14 percent of women choose these high-paying occupations. Compared with these high-paying occupations, the nursing occupations that are far more popular among women tend to pay lower median earnings. For example, median

Table 2. Distribution, Earnings and Earnings Gaps by Occupation in Health Care and Social Assistance sector, Minnesota, 2015

Occupations Held in Health Care and Social Assistance Sector	Distribution of Men (%)	Distribution of Women (%)	Share of Women	Median Annual Earnings Women	Median Annual Earnings Men	Male to Female Wage Gap (%)
Sales and Related	0	0.1	89.7%	\$240,000	na	na
Legal	0.1	0.1	74.4%	\$200,000	\$84,000	-138.1
Arts, Design, Entertainment, Sports and Media	0.3	0.4	82.4%	\$60,000	\$30,000	-100.0
Food Preparation and Serving Related	1.5	1.3	73.1%	\$24,000	\$14,000	-71.4
Community and Social Services	10.6	7	67.8%	\$40,000	\$35,000	-14.3
Transportation and Material Moving	1.6	0.1	16.9%	\$21,000	\$19,000	-10.5
Healthcare Support	5.4	14.3	89.5%	\$30,000	\$29,400	-2.0
Office and Administrative Support	3.3	13.2	92.8%	\$35,000	\$41,600	15.9
Life, Physical and Social Science	1.9	2.2	78.6%	\$50,000	\$60,000	16.7
Business and Financial Operations	2.3	2.9	79.8%	\$48,000	\$60,000	20.0
Personal Care and Service	4.1	12.7	90.8%	\$20,000	\$25,000	20.0
Education, Training and Library	0.9	3.3	91.9%	\$22,200	\$28,000	20.7
Computer and Mathematical	3.9	1.2	48.9%	\$55,000	\$74,000	25.7
Protective Service	0.8	0.2	47.9%	\$35,000	\$48,000	27.1
Healthcare Practitioners and Technical	45.6	32.9	69.9%	\$60,000	\$89,000	32.6
Management	9.1	5.9	67.5%	\$50,000	\$75,000	33.3
Building and Grounds Cleaning and Maintenance	5.3	1.1	39.8%	\$24,000	\$36,500	34.2
Architecture and Engineering	0.2	0.1	49.2%	\$78,000	\$120,000	35.0
Construction and Extraction	0.2	0	41.7%	\$31,000	\$49,000	36.7
Production	1.7	0.9	63.5%	\$20,000	\$35,000	42.9
Installation, Maintenance and Repair	1.1	0.1	15.1%	\$18,500	\$61,000	69.7

Source: American Community Survey, 2015

annual earnings are \$65,000 for registered nurses and \$31,200 for licensed practical and licensed vocational nurses.

Women, however, pay a double penalty in terms of occupational choice. Even within the high-paying physicians and surgeons occupation, women earn a median annual salary of \$175,000, while men earn \$240,000.

Summary

This article analyzed economic variables to explain a 28.3 percent gender earnings gap in health care and social assistance, the largest and most female-dominated sector in

Minnesota. Hours of work, age, education, detailed industry and occupational distribution, and detailed industry and occupational patterns of gender earnings gaps were examined. Findings suggest that all of these variables have significant association with the overall earnings gap.

A particularly important finding is that a significant gendered differential in salary premium due to education is a major cause of the overall earnings gap in this sector. This essentially means that for the same educational attainment, women are paid less than men, after controlling for other factors such as hours of work. In fact, the gap in

salary premium is highest for women with the highest level of education. This finding, which suggests unconscious gender bias in this sector, deserves top priority for further research.

Further investigation of the gendered dissimilarities by and within occupation is also needed. A more formal approach would use the Duncan dissimilarity index and break down the gender earnings gap between the part that is due to across-occupational dissimilarity and the part that is due to within-occupation earnings differential. Delving into the detailed occupation level will also surely reveal valuable insights into the gender earnings gap. ■



Minnesota Finally Seeing Wage Growth

Workers are taking home higher paychecks, thanks to a tighter labor market.



Table 1: Minnesota’s Lowest Annual Unemployment Rates

Year	Unemployment Rate	Labor Force Participation Rate
1998	2.7	74.8
1999	2.8	74.9
2000	3.1	75.4
1997	3.3	74.7
1995	3.7	74.7
2015	3.8	69.4
2001	3.8	75.3
*2017	3.8	69.8
2016	3.9	69.6
1996	3.9	75.0
1978	3.9	67.8

*Through the first 10 months of the year

By all indicators, Minnesota’s labor market continued to tighten in 2017. The state’s annual unemployment rate looks to be headed toward 3.8 percent, joining 2015 and 2016 on the list of the 10 lowest annual jobless rates (see Table 1).¹ Minnesota’s U-6 unemployment rate – the broadest unemployment rate that includes underemployed and

discouraged workers – dropped to 6.8 percent in October, the lowest rate in 16 years.²

Job vacancies reached a record high in the second quarter, with the number of job openings exceeding the number of unemployed workers for the first time since the second quarter of 2001.³ Even the labor force

participation rate, which had been declining since 2000, has reversed direction, inching up over the last few years despite the growing number of retired Minnesotans. The tight labor market might be convincing some people, previously on the job sideline, to rejoin the labor force.

¹Consistent unemployment rates for Minnesota are available back to 1976 at <https://apps.deed.state.mn.us/lmi/laus/>. The 2017 estimate is the nine-month average of seasonally adjusted numbers through September.

²Alternative measures of unemployment for Minnesota are at <https://mn.gov/deed/data/current-econ-highlights/alternative-unemployment.jsp>.

³Minnesota Job Vacancy Survey results are available at <https://mn.gov/deed/data/data-tools/job-vacancy/>.

The ultimate indicator of a tight job market – rising wages – was hard to find earlier in the recovery, but it has emerged in Minnesota over the last few years. Wage growth has accelerated in the tighter Minnesota labor market, giving workers bargaining power for pay increases or giving them opportunities to switch to jobs

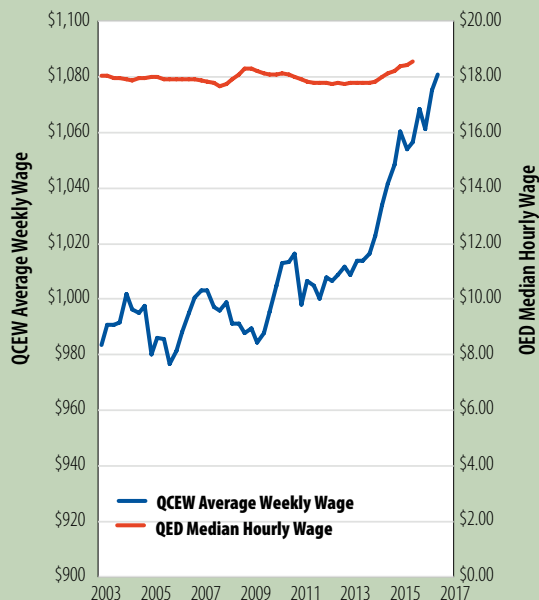
offering fatter paychecks.

Average weekly wages as measured by the Quarterly Census of Employment and Wages has been on a steady upswing for four years, including the first half of 2017.⁴ Real (inflation-adjusted) average wages rose 7.2 percent between the second quarters of 2013 and

2017, compared with 2.6 percent over the previous 10 years, which included a period of declining wages during the recession (see Chart 1).⁵

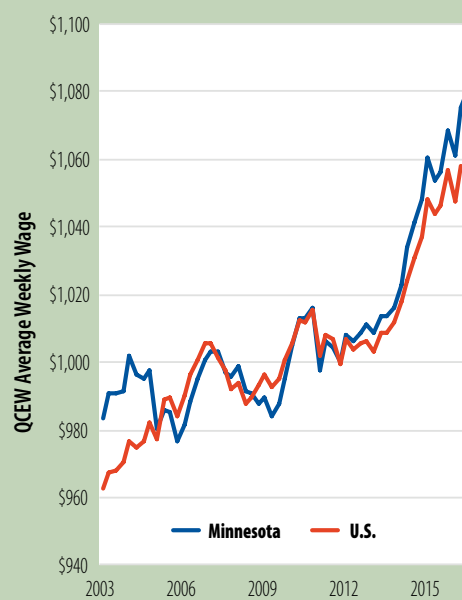
Workers at the top of the pay scale have not enjoyed the faster pace of wage growth, as evidenced by a jump in the Quarterly Employment

Chart 1. Minnesota Average Weekly Wage and Median Hourly Wage, 2003 - 2017



Source : Quarterly Census of Employment and Wages (QCEW), 4=quarter moving average - <https://mn.gov/deed/data/data-tools/qcew/>
 Quarterly Employment Demographics (QED), 4-quarter moving average - <https://mn.gov/deed/data/data-tools/qed/>

Chart 2. Average Weekly Wage, Minnesota and U.S., 2003 - 2017



Source: Quarterly Census of Employment and Wages (QCEW), 4-quarter moving average, <https://mn.gov/deed/data/data-tools/qcew/>

⁴Five measures of wages are presented here. Detailed information on the five-wage series is available at https://mn.gov/deed/assets/Reviewing%20the%20Data_tcm1045-257088.pdf.

⁵All wage data presented here have been inflation-adjusted to 2017 dollars using the Consumer Price Index (CPI) for All Urban Consumers.

Demographics median hourly wage rate. The median wage (half of all workers make more, half make less) actually lost ground from 2003 to 2014, declining by 1.1 percent. But it rose 4.1 percent between 2014 and 2016. (Median wage data are available only through the second quarter of 2016, while average wage data are available through the second quarter of 2017.)

Minnesota's recent average weekly wage acceleration has been stronger than the nationwide uptick (see Chart 2). U.S. average weekly wages rose 5.4 percent between the first quarters of 2013 and 2017, lagging behind Minnesota's 6.9

percent gain. (The 2017 second quarter average weekly wage for the U.S. hasn't been published yet, while Minnesota's is shown in Chart 2.) Minnesota's average weekly wages are once again higher than U.S. average weekly wages after having essentially been equal since 2005.

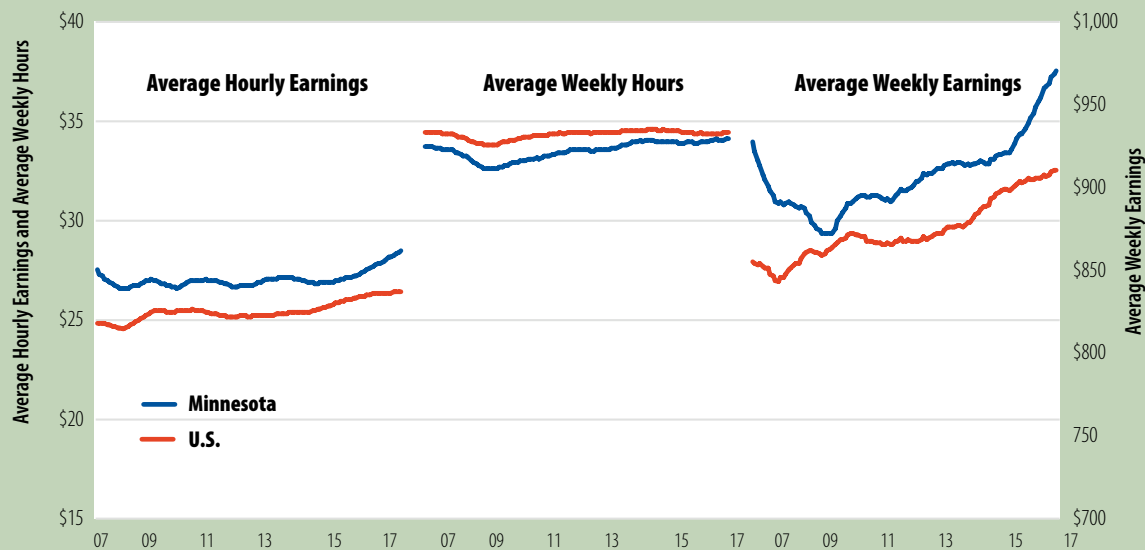
Other wage data are also showing upward wage pressures in Minnesota as the labor market tightens, forcing employers to increasingly compete for qualified workers at all wage levels. Average weekly earnings as estimated in the Current Employment Statistics program show that Minnesota's recent faster wage growth is due to

both longer work weeks and higher hourly wages. Minnesota's average weekly hours, which dipped more than U.S. hours during the recession, are now just slightly lower than U.S. hours (see Chart 3).

Average hourly earnings growth in Minnesota was modest – like U.S. average hourly earnings – between 2010 and 2015 before accelerating significantly faster than U.S. hourly earnings over the last two years. Higher earnings combined with higher weekly hours boosted Minnesota's average weekly earnings by 5.9 percent from September 2015 to September 2017, compared with only 1.2 percent nationwide.



Chart 3. Minnesota and U.S., All Private Employees Average Hourly Earnings, Average Weekly Hours and Average Weekly Earnings, 2007-2017



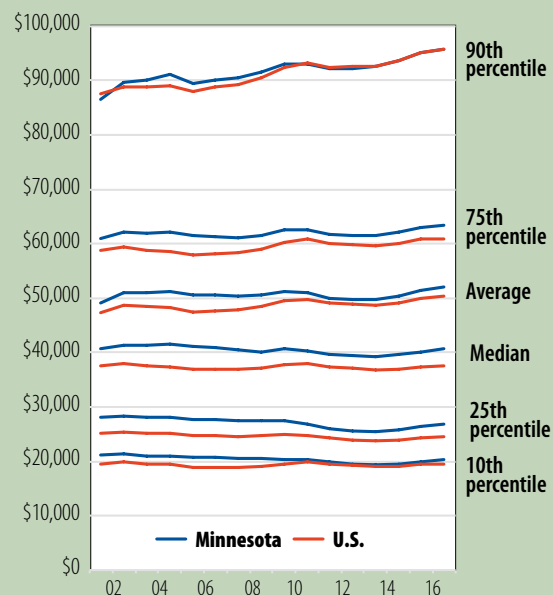
Source: Current Employment Statistics (CES), 12-month moving average private employment, <https://apps.deed.state.mn.us/lmi/ces/Results.aspx>

After moving sideways for at least a decade, real wages are rising in Minnesota across all wage levels. Wage gains for lower-wage groups were higher than higher-wage groups over the last few years, according to Occupational Employment Statistics.

The 10th percentile of annual wages climbed 4.8 percent between 2014 and 2016 in Minnesota, 4 percent for the 25th percentile, 2.6 percent for the 50th percentile, 2 percent at the 75th percentile, and 2.3 percent for the 90th percentile (see Chart 4).

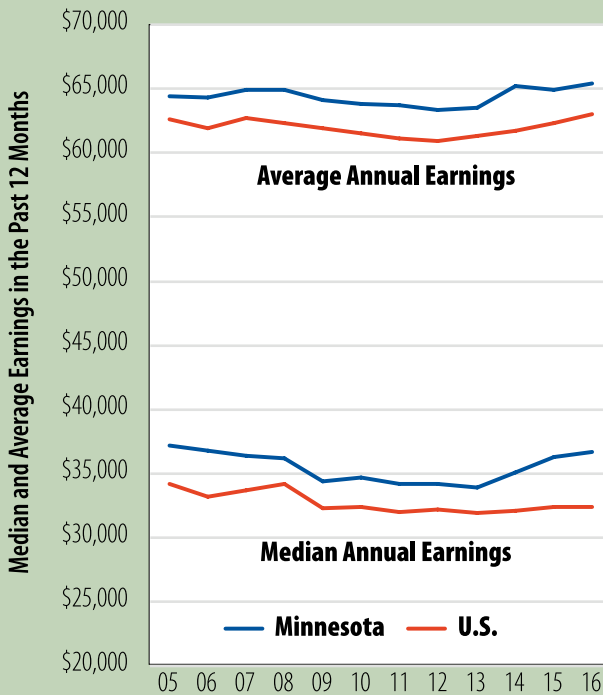
Earnings for workers with below-median wages are still below 2001 pay, but upward pressure on pay for low-wage workers appears to have been stronger during the last few years relative to pay pressure for higher-wage workers. Minnesota pay now exceeds U.S. pay at all levels of

Chart 4. Annual Wage Salary Percentiles, Minnesota and U.S., 2001-2016



Source: Occupational Employment Statistics (OES) <https://www.bls.gov/oes/tables.htm>

Chart 5. Minnesota and U.S. Median and Average Earnings, 2005-2016



Source: American Community Survey (ACS), Table S2001, Earnings in the Past 12 Months, <https://factfinder.census.gov/faces/nav/jsf/pages/index.html>

Minnesota’s job market is significantly tighter than the national job market, and the difference is showing up in faster real wage gains in Minnesota than nationally. Faster-growing paychecks in Minnesota may be a drag on employment growth, as Minnesota employers become less competitive in national and international markets due to higher payroll costs. But higher wages in the state could also work on the supply side by boosting immigration into Minnesota by workers seeking higher pay. A faster-growing labor force would be welcomed by Minnesota employers, even if the boost is fueled by higher wages. ■

wages, except for the highest-paid workers. Minnesota’s 90th percentile annual wage is the same as the U.S. 90th percentile annual wage.

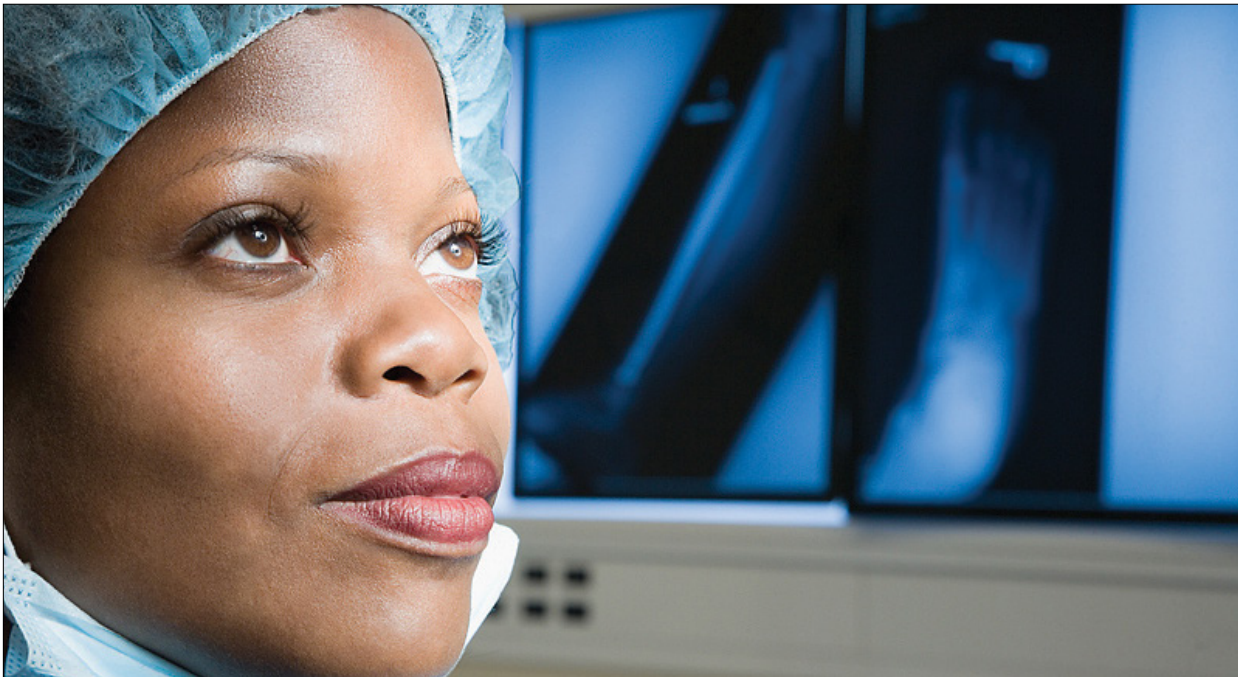
Minnesota workers are also reporting that earnings growth has accelerated. Both median and average earnings by Minnesota workers as reported in the American Community Survey have been climbing since 2013 after having tailed off over the previous decade (see Chart 5).

Median annual earnings were up 8.3 percent between 2013 and 2016 in Minnesota, which is significantly higher than the 1.6 percent gain reported nationwide. Median annual earnings for Minnesota workers were still 1.3 percent below the 2001 level in 2016, but Minnesota workers were substantially better off in 2016 relative to workers nationwide. U.S. median earnings in 2016 were still 5.3 percent lower than in 2001.



Peering Into the Glass Ceiling

Women are less likely than men to be top wage earners in their fields in Minnesota, even in industries where women generally do well.



We know that women earn less than men in Minnesota and nationally. But how does this play out at the very top of organizations? Can women break through the glass ceiling to take the highest-paying jobs in Minnesota?

This analysis looks for outlier earners by industry in Minnesota to identify if women can make it to top earner status within their chosen field. To answer the question, the analysis uses newly available data from DEED and

the Department of Public Safety. They are sharing some limited data, allowing the matching of age and gender from driver's license records with records of hours, earnings and industry from wage records as reported to the Unemployment Insurance Program.

Findings

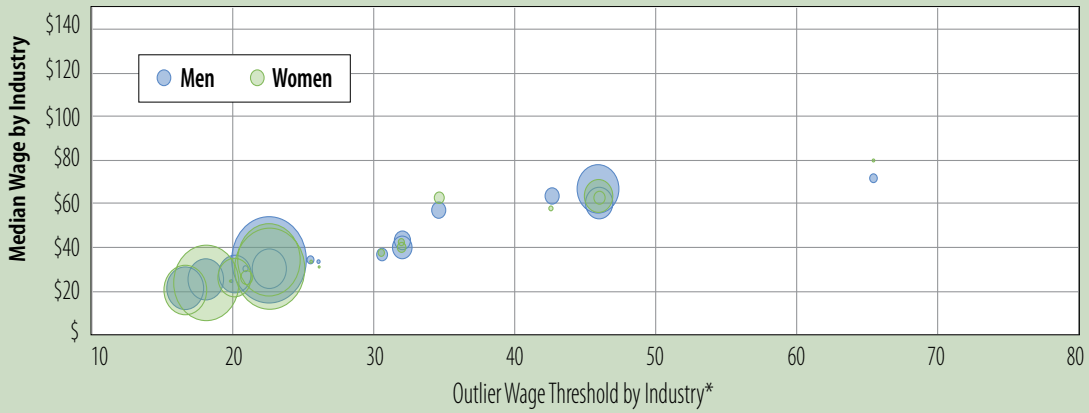
Men are disproportionately likely to be outlier earners in the majority of industries in Minnesota, and they tend

to earn more as outliers than women (see Chart 1). The handful of industries where women are disproportionately likely to be outliers have both lower wages overall and outliers with much lower wages than in industries where males dominate as outliers. The charts below that represent expected performance (a similar number of male and female outliers), and majority women outliers have observations clustered around \$20 per hour. The majority men chart, however, has industries

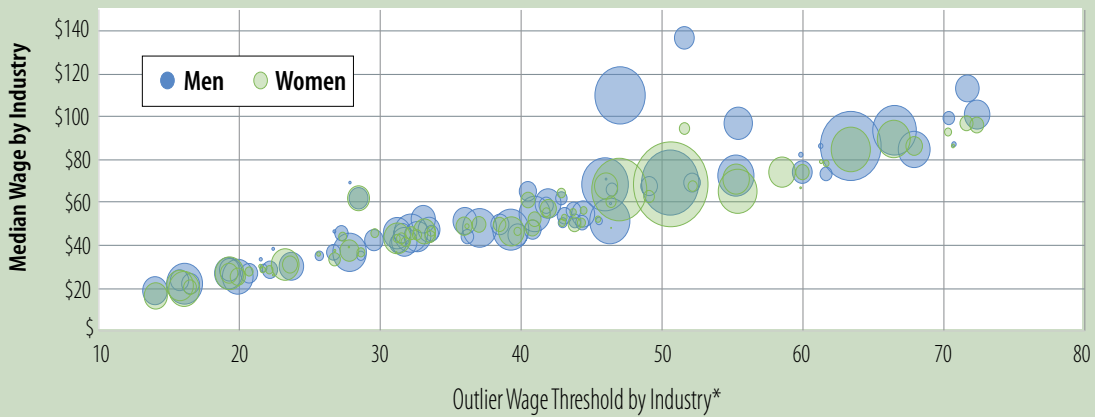
Chart 1. Outlier Earners by Industry and Gender

Each circle represents an industry and the size of the circle represents the number of outliers by gender in that industry.

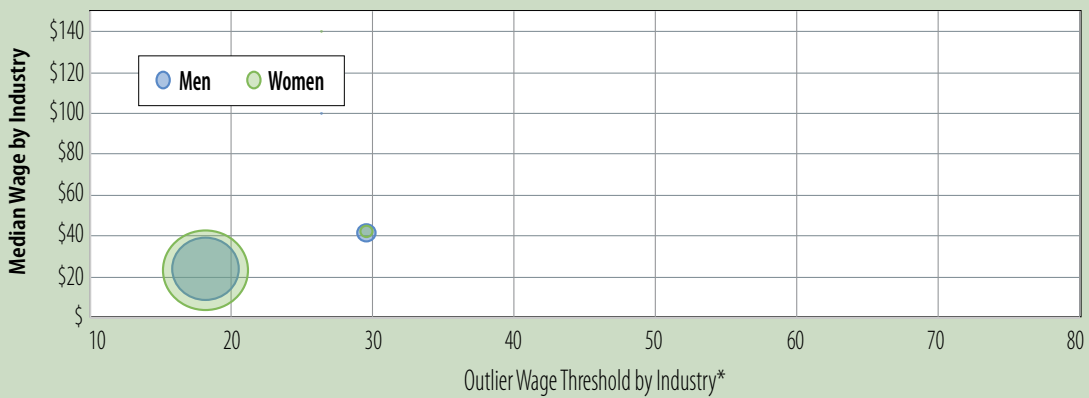
Industries With Similar Numbers of Male and Female Outliers (Expected Performance)



Industries Where the Majority of Outliers are Men



Industries Where the Majority of Outliers are Women



*Outlier Wage Threshold: Anyone earning more than this within an industry is an outlier earner.

Source: DEED Unemployment Insurance data, DPS driver's license data

with the outlier wage up to \$72 per hour.

Results for specific industries bolster this finding (see Table 1). The overall median wage of industries with expected performance (similar numbers of male and female outliers) is \$13.77 per hour. In those industries, men earn a median of \$14.97 per hour to women's \$13.25 per hour.

In industries where women surpass men as outlier earners, the overall median wage is only \$11 per hour, and the gap between the median for women (\$11.02 per hour) and the median for men (\$11.10 per hour) is much smaller.¹

In industries where men surpass women as outlier earners, the median wage overall is \$21.25 per hour, or nearly double the wage for industries where women do disproportionately well as outliers. The gender gap here is greater, too – women earn \$20.03 per hour compared with

\$23.31 per hour for men.

Most Minnesotans (71 percent) are employed in industries where men surpass women as outlier earners. Only 7.8 percent of workers are employed in industries where women surpass men as outlier earners.

In Table 2 (page 28), the top 10 industries by total employment are shown. Highlighted industries are ones where female outliers outnumber male outliers. Across categories, men make up more than half of outlier earners. This means that even when women make up the majority of employment in an industry, men are disproportionately likely to be appointed to top positions. These industries include educational services, ambulatory health care services, hospitals and accommodation.

Health care and teaching are traditional pink-collar job powerhouses that pay well, but the data suggest that the administrators who manage

them and the top doctors are still male-dominated. Furthermore, typically male outliers earn more than female outliers. This is particularly true in health care fields. The median hourly wage for male outlier earners is \$110.07 to women's \$65.75 in ambulatory health care services and \$96.77 for men to \$65.56 for women in hospitals.

Conclusion

Despite gains educationally and professionally over the past several decades, women are still less likely to be outlier wage earners than their male counterparts, even in industries where women generally do well. Gender wage parity and employment ratios, however, have been improving among younger workers and especially in industries that have more young people. We've seen progress toward gender balance in recent years and we should expect to see more going forward. ■

Table 1. Outlier Earners

	Industries with Expected Performance	Industries where Women Surpass Men	Industries where Men Surpass Women
Median Wage	\$13.77	\$11.00	\$21.25
Median Wage for Women	\$13.25	\$11.02	\$20.03
Median Wage for Men	\$14.97	\$11.10	\$23.31
Number of Workers			
Total	681,750	257,131	2,348,131

Source: DEED Unemployment Insurance data, DPS driver's license data

¹The data set has missing values for gender. Records with a null value for gender are included in the total but not in the male or female medians.

Table 2. Top Industries by Employment and Outlier Performance

	Employment	Outlier Earners			
		Female	Median Wage Female	Male	Median Wage Male
Industries With Similar Numbers of Men and Women					
Nursing and Care Facilities	91,158	16,258	\$29.97	3,861	\$30.54
Social Assistance	78,475	14,058	\$23.89	4,179	\$25.10
Admin. and Support Services	68,933	12,913	\$33.96	18,402	\$33.91
General Merchandise Stores	39,235	6,050	\$20.50	4,490	\$21.12
Amusement, Gambling and Recreation	20,778	3,660	\$26.16	3,483	\$27.50
Merchant Wholesalers, Non-Durable Goods	16,007	2,675	\$63.37	5,784	\$67.02
Construction of Buildings	4,228	417	\$62.40	2,460	\$60.10
Private Households	3,491	479	\$26.50	86	\$29.98
Warehousing and Storage	2,162	325	\$62.39	653	\$57.13
Non-Metallic Mineral Product Manufacturing	1,640	244	\$40.29	1,267	\$39.90
Industries With More Men than Women					
Educational Services	179,195	24,182	\$68.77	14,241	\$69.60
Ambulatory Health Care Services	118,242	13,149	\$65.75	11,007	\$110.07
Hospitals	92,158	6,542	\$65.56	3,502	\$96.77
Professional, Scientific, and Technical Services	74,512	6,672	\$84.74	16,040	\$86.26
Management of Companies and Enterprises	45,649	4,709	\$89.74	8,268	\$93.75
Credit Intermediation and Related Activities	38,152	3,035	\$70.67	5,684	\$72.22
Executive, Legislative and Other	33,675	2,852	\$46.34	5,648	\$47.41
Food and Beverage Stores	30,654	4,118	\$19.96	5,599	\$22.33
Religious and Grantmaking	24,934	3,184	\$43.30	3,298	\$45.52
Accommodation	22,029	3,592	\$26.73	3,354	\$26.55
Industries With More Women than Men					
Food Services and Drinking Places	108,073	23,510	\$23.04	14,412	\$23.89
Furniture and Related Product Manufacturing	2,414	473	\$42.41	1,093	\$41.33
Postal Services	13	1	\$140.00	1	\$100.00
Rail Transportation	11	3	\$227.50	4	\$158.24

Source: DEED Unemployment Insurance data, DPS driver's license data

Meet

THE WRITERS



SANJUKTA CHAUDHURI

Chaudhuri is a DEED research analyst, focusing on local area unemployment statistics, labor market projections and workforce alignment. She has a Ph.D. in economics from the City University of New York in New York City. She also has a bachelor's degree in economics and a master's in business administration, both from India.



STEVE HINE

Hine is the director of the Labor Market Information Office at DEED. He has a master's degree and Ph.D. in economics from Washington State University in Pullman and a bachelor's degree from Bemidji State University.



CAMERON MACHT

Macht is the regional analyst and outreach manager at DEED. He has a bachelor's degree in organizational management and marketing from the University of Minnesota-Duluth. Before joining DEED, he worked for a corporate training company and a market research consulting firm, both in the Twin Cities.



AMANDA ROHRER

Rohrer is a labor market analyst at DEED. She holds a bachelor's degree from the University of Iowa in Iowa City and a master's degree in public policy from the Humphrey Institute at the University of Minnesota.



DAVE SENF

Senf is a labor market analyst at DEED. He has a bachelor's degree in economics from the University of Montana in Missoula and a master's degree in regional economics from Colorado State University in Fort Collins.

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DEED COMMISSIONER **Shawntera Hardy**; LABOR MARKET INFORMATION DIRECTOR **Steve Hine**; ASSISTANT DIRECTOR AND CONTENT MANAGER **Oriane Casale**; EDITOR **Monte Hanson**; GRAPHICS/LAYOUT AND WEBPAGE PREPARATION **Mary Moe**; DISTRIBUTION **Debbie Morrison**.

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LABOR MARKET INFORMATION

1st National Bank Building
332 Minnesota Street, Suite E200
St. Paul, MN 55101-1351

LMI HELPLINE: 651-259-7384

LMI RECEPTIONIST: 651-259-7400 • 1-888-234-1114

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