MINNESOTA ECONOMIC

TRENDS

THE MENTAL HEALTH WORKFORCE SHORTAGE

MINNESOTA GRAPPLES WITH GROWING DEMAND FOR PROFESSIONALS

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EMPLOYMENT AND ECONOMIC DEVELOPMENT

Meeting the Mental Health Challenge

The shortage of counselors and other mental health professionals in Minnesota has been the subject of much debate in recent years, with a report to the Legislature in 2015 calling the problem critical, especially in Greater Minnesota.

The cover story by Alessia Leibert and Teri Fritsma in this issue of Trends investigates the issue further, looking at the state's educational pipeline for mental health workers, potential policy implications and more.

Minnesota colleges and universities produced nearly 10,000 graduates of mental health-related programs from 2006 to 2014, but low rates of licensure in some occupations, pay imbalances, difficulty attracting professionals to rural areas and other factors have combined to create a shortage of qualified workers.

There's no easy fix, but one thing is certain. As the state's population increases, the need for more highly-trained mental health workers will grow.

Elsewhere in this issue, Sanjukta Chaudhuri explores the gender wage gap in 20 major industries in the state, while Dave Senf takes a deep dive into Minnesota per capita income. DEED intern John Stevens looks at millennials – now Minnesota's largest workforce demographic – and the types of fields they are entering.

This issue highlights what I've always liked about editing and reading Trends. The stories contribute to my knowledge of the state economy and help me understand how the workforce is evolving. I hope you find our coverage valuable as well.

Monte Hanson
Editor

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Filling the Mental Health Pipeline

Minnesota is struggling to meet growing demand for mental health workers, particularly in rural parts of the state.

While many people pursue higher education in mental health-related fields like psychology, counseling, social work, and marriage and family therapy, a scarcity of mental health providers throughout Minnesota is raising considerable concern.

Long wait times for clinical appointments and lack of access to mental health specialists—particularly in rural areas of the state—have, in recent years, prompted a variety of studies, task forces and legislative interventions to increase the size of the mental health workforce. Though these efforts have met with some success, they have also highlighted significant challenges around defining and quantifying the state's mental health workforce.

Mental health providers come from at least five different profession types, covering nine different professional licenses that occupy separate but overlapping niches of service.[1] As we will see, there is also a large non-licensed contingent of workers in social service industries, making it even more difficult to estimate the supply and demand for mental health workers.

Compared with the straightforward training and licensure requirements for similar health professions such as nursing, pharmacy or dentistry,

the mental health workforce includes providers with varying levels of education, licensure, scopes of practice and job requirements. Yet without a way to count them, it is extremely difficult to evaluate whether efforts to grow the mental health workforce are effective.

This article is the first attempt, to our knowledge, to provide a comprehensive investigation into Minnesota's complete mental health workforce. Our goals are to (1) identify and describe the educational pipeline for mental health workers in Minnesota; (2) examine both the licensed and unlicensed workforce in order to determine the extent to which these two groups are occupying a similar niche in the labor market; (3) identify which regions struggle most to attract licensed mental health providers; and (4) discuss potential policy implications of the findings.

The Mental Health Educational Pipeline

Following the federal Health Resource and Services Administration and the Minnesota Legislature,[2] this study includes the following groups as part of the mental health workforce:

1. Mental health **professionals** include licensed psychologists, licensed independent clinical social workers, licensed professional clinical counselors, and licensed marriage and family therapists. These are highly trained professionals who complete a graduate degree (master's or above), hours of supervised clinical work and a licensure examination. Their scope of practice, as defined by the Minnesota Legislature, allows them to provide independent clinical services, including therapy.

2. Mental health **practitioners** include licensed social workers, licensed graduate social workers, licensed independent social workers (excluding independent clinical social workers) and licensed professional counselors (excluding professional clinical counselors). By law, these providers may offer clinical or therapeutic services to people with mental illness (excluding licensed social workers), but only under the supervision of mental health professionals. We also include licensed alcohol and drug counselors in this group. They have a limited scope that does not include mental health counseling, but they are nevertheless part of the licensed workforce that interfaces with mental health patients and clients.

3. **Non-licensed** mental health/social service workers include graduates of mental health-related programs who are employed in health care, social assistance, education or public administration industries but did not obtain licensure. These workers often go uncounted in studies of the mental health workforce. Though they lack the legal authority to diagnose or create a plan of care for patients with mental illness, they comprise a large share of workers who provide direct service and support. (It is important to note that under state law, people providing mental and behavioral health services must be licensed. See the sidebar on page 7 for more details.)

Consequently, the formal educational pipeline for mental health workers includes all individuals who pursue training that prepares them for licensure as one of these provider types, regardless of whether they obtain licensure. We include all graduates in this study in order to get a comprehensive picture of those who are likely providing mental or behavioral health and related social services in Minnesota. Only the work of licensed mental health practitioners and professionals, however, is governed by

Table 1: Educational Pipeline and Licensure Requirements by Profession Type

Provider type/Licenses	Educational pipeline	Current education and supervised practice requirements for licensure	Example job titles
Mental Health Professionals			
Psychologists (LP)	Doctorate in psychology (except educational psychology)	• Doctorate in psychology • 1,800 hours of postdoctoral supervised employment in psychology	Clinical or private practice psychologist
Social Workers (LICSW)	Graduate degree in social work	• Graduate degree in social work • 200 hours of direct supervision over 4,000 hours of post-graduate clinical practice.	Clinical social worker; licensed therapist
Marriage and Family Therapists (MFT); Licensed Professional Clinical Counselors (LPCC)	Graduate degree in counseling, marriage and family therapy, or a related degree	• LMFT: Graduate degree in marriage and family therapy or a related field from an accredited program and 200 hours of direct supervision over 4,000 hours of supervised professional practice. • LPCC: Graduate degree in counseling or a related field from an accredited program and 200 hours of direct supervision over 4,000 hours of supervised professional practice.	Marriage and family therapist; licensed mental health counselor; behavior analyst
Mental Health Practitioners			
Social Workers (LSW, LISW, LGSW)	Bachelor's or graduate degree in social work, depending on license type	• LSW: Bachelor's degree in social work. 4,000 hours of supervised practice is required after the license is issued. • LGSW: Graduate degree in social work. 4,000 hours of supervised practice is required after the license is issued. • LISW: Graduate degree in social work. Supervised non-clinical practice is required before licensure: 100 hours of direct supervision over 4,000 hours of non-clinical practice.	Caseworker; protective service worker; adoption social worker; mental health practitioner
Counselors (LADC, LPC)	Bachelor's or graduate degree in counseling, with emphasis on substance abuse, depending on license type	• LADC: Bachelor's degree with at least 18 semester hours of alcohol and drug counseling coursework, and an 880-hour alcohol and drug counseling practicum. • LPC: Graduate degree in counseling or a related field from an accredited program and 100 hours of supervision over 2,000 hours of professional practice that occurs either before or after licensure.	Alcohol and drug counselor; substance abuse counselor; correctional counselor; employment counselor

[1]*Sources: Online information and personal conversations with the boards of Psychology, Social Work, Marriage and Family Therapy, and Behavioral Health and Therapy. These requirements are subject to change and only include education and clinical supervision hours. Licensure also requires an examination, and some licenses also require supervised field experience in a graduate program.*

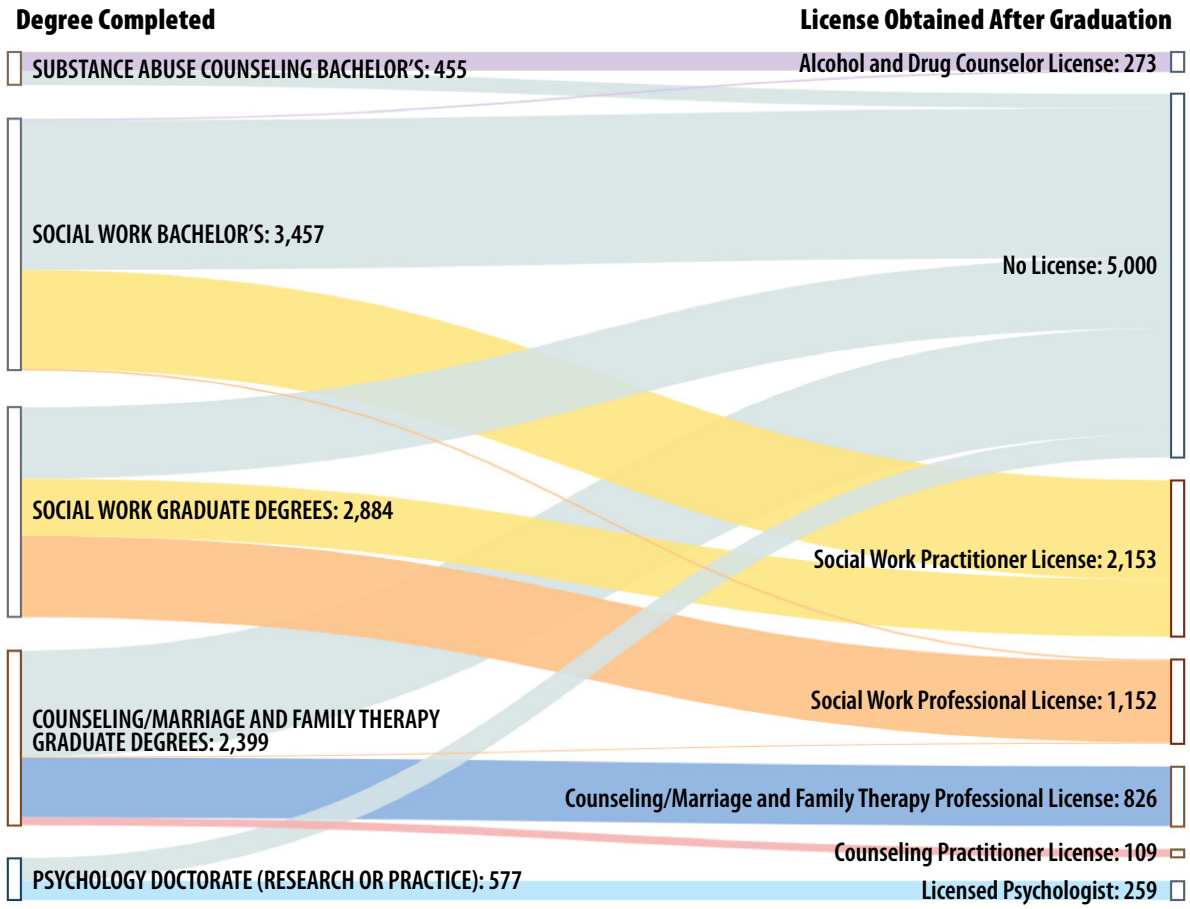
Minnesota law and sanctioned by state licensing boards. As shown in Table 1, Minnesota licensing standards vary widely by profession, with educational requirements ranging from a bachelor's degree to a doctorate.

Broadly speaking, two factors determine the supply of professional mental health providers: (1) the size of the pipeline and (2) the rate at which graduates become licensed. As of 2015, Minnesota employed an estimated 22,630 workers in mental health-related occupations, including both licensed and non-licensed employees.[3] In just nine years—from July 2006 to June 2014—Minnesota colleges and universities produced nearly half that number of graduates (9,851) in the mental health-related programs identified in Table 1.[4]

Of these 9,851 Minnesota graduates, only half (49.1 percent) pursued licensure. Figure 1 displays the share of graduates who went from degree to licensure by field of specialization. The likelihood of pursuing a license varies by field. During this period, master's-level graduates of marriage and family therapy as well as counseling programs were the least likely to pursue a license, whereas master's-level graduates in social work were the most likely.

Interestingly, among master's graduates in social work, one out of four decided to obtain a practitioner's license rather than a professional license. In some

Figure 1. Shares of Graduates in Mental Health Related Programs Who Became Licensed After Graduation, Classes of 2007 - 2014



cases, this could be because master's-level social work graduates have obtained the practitioner license but are still working toward a professional-level license.

In terms of size, the largest pipeline is in social work and the smallest in psychology Ph.D.s. It is important to point out that bachelor's programs in psychology are extremely popular among students. From July 2006 to June 2014, Minnesota colleges produced nearly 14,710 bachelor's graduates in psychology. This large supply, however, either did not continue in school or leaked out to other fields. Only 20—less than 1 percent—completed a doctoral-level credential in psychology.

Table 2 shows how long it took to obtain a license after completing the required degree. Graduate degree holders in counseling, marriage and family therapy, social work, and psychology took between 23 and 37 months on average to complete a license. In contrast, bachelor's graduates in social work and substance abuse/addiction counseling obtained licensure within 19 and 10 months on average, respectively.

The pipeline of practitioners is strong because practitioner-level licensure requires far fewer supervised practice hours than professional-level licensure. Obtaining the supervised practice hours can create a significant barrier, because prospective licensees are frequently responsible not only for finding a practicing professional to serve as their supervisor, but often they must pay supervisors for that time directly out of their own pockets.

The low rate of licensure among psychologists raises a special concern. According to the Minnesota Department of Health's 2016 Healthcare Workforce Survey, psychology is demographically the oldest mental health profession, with a median age of 57. Roughly one-quarter of practicing psychologists indicated on the survey that they planned to leave the profession within five years, most to retire. If the graduation and licensing rate of doctoral-level psychologists continues at the meager pace we see here, it will not be enough to fill the need or the demand (which many have argued is already woefully undersupplied).

Among the three types of professional-level licenses—marriage and family therapists, independent clinical social workers and licensed professional clinical counselors (LPCC)—LPCCs are closest to psychologists in terms of the theoretical underpinnings and orientation of their educational

Table 2: Graduates to License Flows, Classes of 2007-2014

Field and degree level	Total graduates*	Graduates who obtained a license after graduation	Rate of licensure	Average months from degree to licensure
Substance Abuse Counseling Bachelor's	514	295	57.4%	10
Social Work Bachelor's	3,457	1,407	40.7%	19
Social Work Graduate Degree	2,884	1,908	66.2%	31
Counseling/Marriage and Family Therapy Graduate Degree	2,414	962	39.9%	37
Psychology Doctorate (research or practice) **	582	264	45.4%	23
Total	**9,851**	**4,836**	**49.1%**	

*Includes graduates who had at least one quarter of employment in Minnesota wage records since 2003.
**Note that of the 582 doctorate completers in psychology, 246 completed a research (as opposed to a clinical) track.

Source: see "About this Data" on page 8 for additional data details.

coursework. Therefore, they may be best positioned to at least partially fill the gap left by retiring psychologists.[5]

But while the number of master's-level counselors is more than adequate, their rate of licensure (39.9 percent, combined with marriage and family therapy graduates) is low, and the length of time from graduation to licensure is long. The low rate of licensure in this group might be because the LPCC license itself is new, dating back to 2008. The licensed counseling profession is growing, and we expect the licensure rate will increase over time.

In general, these findings raise concern, but also pinpoint areas of opportunity. We return to this discussion in the final section of this report.

Comparing Licensed and Non-licensed Graduates

The approximately 5,000 non-licensed mental health graduates pose a puzzle: Are they, in fact, part of the mental health workforce, and should they be factored in to discussions about supply and demand of this critical group of providers?

Recall that people who provide mental health services must be licensed in Minnesota (see sidebar). However, non-licensed mental health program graduates who work in social service-oriented positions take a wide variety of settings and roles, some of which overlap with licensed positions in terms of skill requirements and duties. They may work as life coaches, independent living skills specialists, youth program coordinators, clinic intake coordinators and direct care providers, for example. A key difference between licensed and non-licensed workers is the degree of independent decision-making permitted by Minnesota law. Non-licensed mental health workers can provide direct or "front line" care under supervision, and they are not permitted to diagnose patients or devise treatment plans.

Beyond that, however, the distinction between licensed and non-licensed mental health positions can be blurred. Some employers advertise positions open to both licensed and unlicensed applicants. DEED's Job Vacancy Survey shows that only about half of all job openings for positions advertised as mental health counselors or substance abuse counselors required licensure in the 2015-2016 period. Licensure was required for about 70 percent of

Licensure in Mental Health Professions

Licensing is intended to protect the public by ensuring that competent and ethical individuals practice in an occupation.

State law mandates that individuals must be licensed to provide mental or behavioral health services, with very few exceptions. The four state licensing boards of Psychology, Marriage and Family Therapy, Behavioral Health and Therapy, and Social Work are responsible for establishing and enforcing state laws that govern professional standards in these fields.

In practice, however, the distinction between work that requires a license and work that does not is difficult to enforce, especially in human service or social assistance fields that may not involve the provision of mental health services.

It is important to note that licensing boards, not employers or workers, ultimately have the authority and responsibility to determine who needs to be licensed.

About This Data

This research relies primarily on three data sources: (1) 2016 public licensure data from the four licensing boards that govern the licensure of the mental health workforce: Psychology; Social Work; Marriage and Family Therapy; and Behavioral Health and Therapy; merged with (2) wage record data from DEED and (3) post-secondary graduation records from the Office of Higher Education, which covers for-credit public and private programs of one term or longer in Minnesota.

Included in the dataset are 9,851 graduates from 23 institutions in Minnesota, both public and private, who obtained a post-secondary credential from July 2006 to June 2014. Graduates who earned more than one degree in the same academic year were classified according to the highest degree obtained.

The dataset used for the labor market outcomes analysis (Figures 2-3 and Table 3) has fewer than 9,851 records because of a few exclusions. Graduates who went to work for the federal government, owned their own small unincorporated business, or left the state are excluded because these workers are not covered by the Minnesota Unemployment Insurance Program. Graduates older than 60 at the time of graduation were excluded because people who are near retirement might skew the results of a study of labor market outcomes.

job openings listed as marriage and family therapists and for 70 to 80 percent of those listed as social work positions.

By contrast, nearly all other job vacancies that involve diagnosing or treating health conditions required licensure. All openings for doctors, physician assistants, dentists, dental hygienists, occupational therapists and speech-language pathologists required licensure. And nearly all vacancies for registered nurses and physical therapists required licensure. While no hospital would consider hiring a non-licensed registered nurse, these findings suggest that some employers view licensed and non-licensed mental health workers as interchangeable.

To better understand the role of non-licensed workers, we examine two questions. First, do non-licensed graduates work in similar industries (settings) as licensed workers? Second, to what extent does licensure bring higher market rewards such as stable employment and higher wages?

Comparing the Industries of Licensed and Non-Licensed Workers

By and large, licensed and non-licensed mental health graduates work in similar industries. Figure 2 displays all mental health program graduates by their industry of employment, and allows us to compare the share of licensed versus non-licensed graduates across various industry settings.

Licensed providers are more likely to be employed in the health care industry compared with their non-licensed counterparts (23.4 percent versus 14.6 percent). They are less likely to be employed in industries other than health care, social assistance, education and public administration (3.8 percent versus 10.3 percent).

Overall, though, employment similarities outweigh differences, with the health care sector being the most likely employer and the education sector being the least likely. These findings further support the idea that licensed and unlicensed graduates occupy the same "space" in the market—and that non-licensed employees, while legally barred from performing certain duties, are clearly serving in roles that support and contribute to mental health outcomes in Minnesota.

Comparing Market Rewards of Licensed and Non-Licensed Workers

The next question focuses on the market returns associated with licensure. Full-time, year-round employment is an indicator of job quality and stability. As shown in Figure 3, full-time, year-round employment is by no means a given among these recent mental health graduates, particularly among licensed counselors, who have a roughly 54 percent chance of working full-time, year-round.[6]

Across the board, however, licensed mental health providers have a higher chance of securing

Figure 2. Distribution of Mental Health Program Graduates by Industry Sector and License Status N=6,181

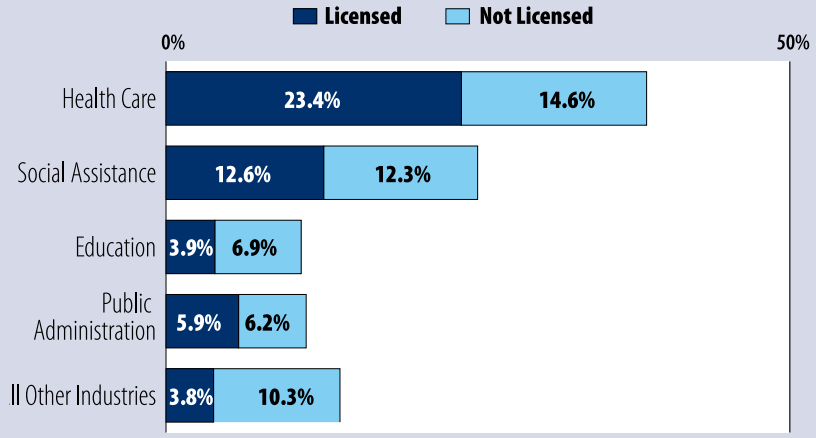


Figure 2 includes graduates aged 20-60, in their third year after graduation.
Source: See "About this Data" on page 8 for additional data details.

Figure 3. Share of Mental Health Program Graduates Employed Full-Time and Year-Round, by Field of Study and License Status N = 4,783

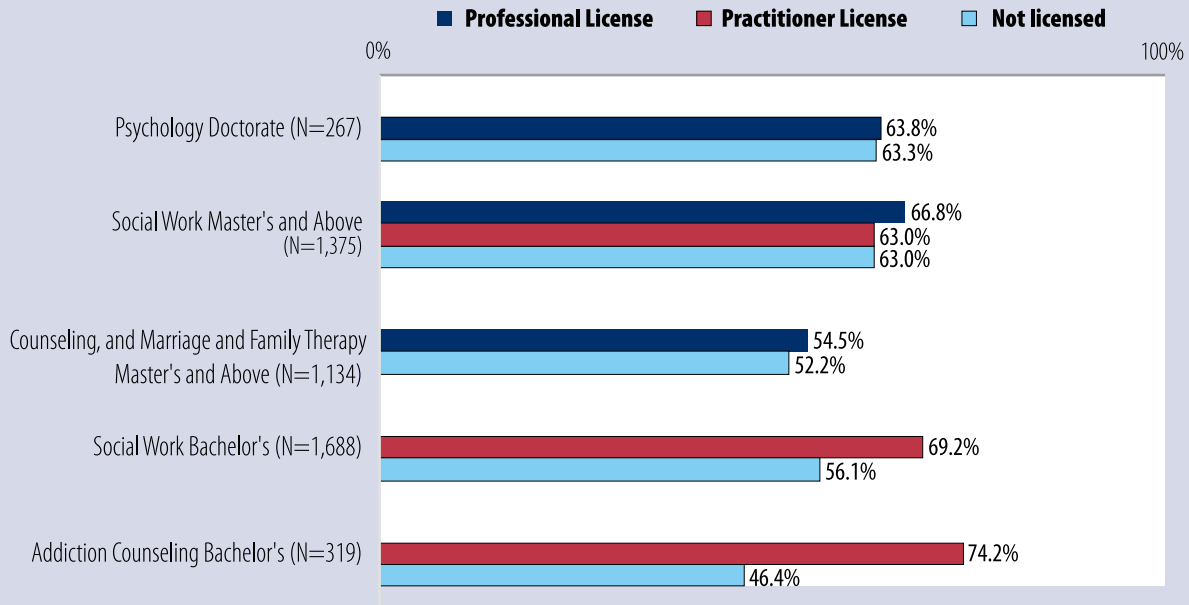


Figure 3 includes graduates aged 20-60, in their fourth year after graduation. Full-time year-round employment is defined as working each quarter of the year for at least 1,820 hours, representing an average of 35 hours a week for a full year.
Source: See "About this Data" on page 8 for additional data details.

stable, full-time employment after graduation compared with others with the same education but no license. In general, licensed social workers and licensed alcohol and drug counselors are most likely to land this type of stable employment.

Even more than job quality and stability, wages are often regarded as the quintessential market reward. Table 3 shows the difference in median hourly wages in the fourth year after graduation for each mental health pipeline group by licensure status and industry (work setting).[7]

Before turning to a discussion of these results, it is important to note that the wage data may exclude some graduates who are working in their own small, unincorporated private practices. This exclusion has the potential to skew results because professionals in private practice are likely earning more than their non-private practice counterparts. Analyses suggest, however, that any bias that exists is minimal.

Overall, 92.4 percent of graduates (four years after graduation) are included in the analysis. Of the 7.6 percent who were excluded, some were excluded because they were no longer in Minnesota or they were not working. An examination of a sample of records showed that most self-employed mental health professionals were identified in DEED wage records and therefore were included in the wage analysis.

There are three main findings to note in Table 3. First, wages generally increase with educational attainment, with the lowest among bachelor's holders and highest among doctorate degree holders.

Second, there is indeed a wage premium associated with licensure. Licensed graduates earn more than non-licensed graduates in every single industry, with only two exceptions—doctorate-level psychology graduates employed in other industries unrelated to mental health, and master's-level social workers who are employed in nursing and residential care facilities.

Third, differences in the distribution of graduates across industries explain some of the differences in earnings across groups. Since wages are almost always highest in hospitals and lowest in social assistance, licensed graduates with lower concentrations in hospitals and higher concentrations in social assistance have lower earnings overall relative to others with the same education level. In particular, mental health counseling professionals have relatively lower wages partially because they can't take advantage of high-paying sectors.

Both wage levels and wage premiums vary substantially by industry setting. Some industries

Table 3: Median Hourly Wages Earned in Selected Industries, by Field of Study and License Status, Fourth Year After Graduation

Industry	Share of Employment in the Industry	Hourly Wage Not Licensed	Hourly Wage Licensed	License Wage Premium (%)
Psychology Doctorate (N=211)				
Clinics, Including Mental Health	39.8%	less than 12	$35.84	NA
Hospitals	13.7%	less than 12	$41.68	NA
Social Assistance	8.1%	less than 12	$42.60	NA
Education	15.2%	$26.03	$29.50	13.3%
Other Industries	23.2%	$43.83	$35.80	-18.3%
Total, All Industries	**100%**	**$32.21**	**$38.33**	**19.0%**
Social Work Master's and Above (N=1,160)				
Clinics, Including Mental Health	20.2%	$23.00	$24.94	8.4%
Nursing and Residential Care Facilities	7.7%	$25.68	$22.97	-10.5%
Hospitals	12.6%	$28.28	$28.89	2.2%
Social Assistance	24.7%	$22.98	$22.89	-0.4%
Public Administration	15.3%	$26.74	$27.54	3.0%
Education*	13.0%	$26.38	$30.68	16.3%
Other Industries	6.5%	$23.65	$26.95	14.0%
Total, All Industries	**100%**	**$25.31**	**$26.25**	**3.7%**
Counseling and Marriage & Family Therapy Master's and Above (N=1,043)				
Clinics, Including Mental Health	27.3%	$20.29	$25.11	23.8%
Nursing and Residential Care Facilities	5.9%	$21.13	$26.31	24.5%
Hospitals	6.0%	$23.12	$29.45	27.4%
Social Assistance	26.2%	$20.06	$24.24	20.8%
Public Administration	5.9%	$26.13	$27.64	5.8%
Education*	13.4%	$24.95	$24.17	-3.1%
Other Industries	15.1%	$24.22	$29.61	22.3%
Total, All Industries	**100%**	**$22.28**	**$25.60**	**14.9%**
Social Work Bachelor's (N=1,761)				
Clinics, Including Mental Health	9.8%	$17.54	$19.39	10.5%
Nursing and Residential Care Facilities	17.1%	$16.84	$20.48	21.6%
Hospitals	4.4%	$19.50	$24.91	27.8%
Social Assistance	27.7%	$17.12	$19.17	12.0%
Public Administration	15.2%	$21.80	$23.42	7.5%
Education*	7.7%	$17.02	$24.31	42.8%
Other Industries	18.2%	$16.94	$20.33	20.0%
Total, All Industries	**100%**	**$17.64**	**$20.86**	**18.3%**
Addiction Counseling Bachelor's (N=266)				
Clinics, Including Mental Health	23.7%	less than 12	$21.89	NA
Nursing and Residential Care Facilities	26.7%	$19.21	$22.59	17.6%
Hospitals	16.5%	less than 12	$22.44	NA
Social Assistance	10.2%	$17.49	$22.52	28.8%
Public Administration	9.8%	$21.40	$21.70	1.4%
Other Industries	13.2%	$15.72	less than 12	NA
Total, All Industries	**100%**	**$19.63**	**$22.21**	**13.1%**

Note: All wage figures have been adjusted for inflation to be in terms of constant 2015 U.S. dollars.

*Note that social workers (at both the bachelor's and master's levels) who work in education are most likely to be employed in elementary and secondary schools and counselors are evenly split between elementary/secondary and university-level institutions. Wages are higher for mental health workers in elementary/secondary schools than they are in colleges and universities.

Source: The figures presented in this table include graduates who had an employment record in Minnesota in their fourth year after graduation. We limit the display only to graduates ages 20 to 35 because wages for older graduates are more likely to be influenced by work experience than by post-secondary education. Individuals who obtained a license after 45 months from graduation were also excluded because we are unable to determine the impact of licensure on wage results.

See "About this Data" for additional data details.

offer both higher wages and a larger wage premium for licensure, while others offer one but not the other advantage. Caution is warranted in interpreting the wage premium results. Premiums ranging from -10 to +10 have to be interpreted as "neutral." Premiums greater than 10 percent indicate license holders earned more than non-license holders among this group of graduates, but we would need a much larger sample to know exactly how much more.

We see the smallest wage premiums in public administration, presumably because these jobs often do not require a license. For example, social work graduates who are county human services workers are not required to be licensed under current state law, though many are licensed voluntarily.

In contrast, some of the largest wage premiums for licensure are in the education sector for social workers. Licensed social workers at the bachelor's and master's level earn approximately 42.8 and 16.3 percent more, respectively, in this sector than their non-licensed counterparts.

The health care sector (including clinics, hospitals, and nursing and residential care facilities) presents a mixed picture. The wage premium in hospitals is stronger than in other health care settings, ranging from about 2.2 percent to 27.8 percent, suggesting that licensure is in relatively high demand at hospitals and that licensed workers perform more complex tasks than their non-licensed counterparts.

This is not always the case in clinics and nursing and residential care facilities, where we find no wage premium for licensure at the master's level for social workers, and modest premiums—around 20 percent or less—for other licensed graduates. Such modest wage differentials may not be enough to offset the cost of licensure, especially at the professional level. Even more importantly, wage levels in these two health care sectors are lower than in other industry settings, with the exception of social assistance.

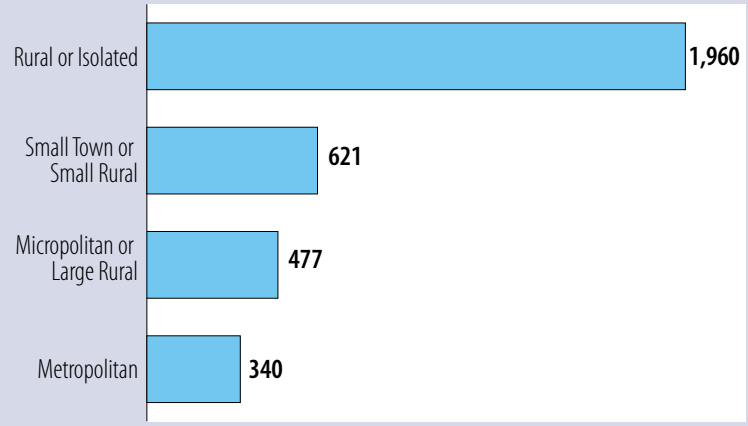
These findings raise questions: Can counseling, marriage and family therapy, and social work graduates access similar types of jobs in clinics and nursing and residential care facilities, regardless of licensure? Lower wage levels and modest wage premiums for licensure among individuals with the same education can cause imbalances

in the mental health workforce by discouraging the pursuit of a license in certain segments, or by discouraging employment in the health care sector. Furthermore, if public sector wages for non-licensed individuals are higher than what a licensed individual can make in the health care industry, the incentives to pursue a license will diminish.

Finally, it is important to point out that regardless of pipeline group or licensure status, these wages are below standard compared to others with the same level of education and credentialing required. In 2017, registered nurses (who require an associate degree and license for employment) earned median hourly wages of $36.25. Likewise, occupational, respiratory, speech-language and physical therapists—all licensed occupations requiring comparable amounts of education to mental health professionals—earned median hourly salaries of at least $32. The wages of highly-trained mental health care professionals are closer to those of providers such as licensed practical nurses, respiratory therapy technicians and medical laboratory technicians, all of which require only associate degrees and only one of which requires a license.

Stakeholders have advocated for retention strategies that focus on career laddering opportunities for mental health paraprofessionals. These wage results, however, underscore the challenge for an associate or bachelor's graduate to progress in a mental health career. Without some kind of loan forgiveness program or other incentive, it is hard to imagine how a bachelor's graduate in a mental health program who is already employed could easily afford the cost of a master's degree and licensure.

Figure 4.
Minnesota Population-to-Mental Health Provider Ratios by Geography Type



Data Source: Boards of Psychology, Nursing, Behavioral Health and Therapy, Social Work, and Marriage and Family Therapy. Figure 4 includes the following licensed professions: licensed independent clinical social workers, licensed professional counselors, licensed professional clinical counselors, licensed alcohol and drug counselors, licensed psychologists, licensed marriage and family therapists, psychiatric certified nurse specialists, and psychiatric nurse practitioners.

Urban/Rural Distribution of the Mental Health Workforce

There are two distinct stories when it comes to the health care workforce: an urban story and a rural one. While health care professionals are generally available and accessible in most metropolitan areas, rural areas consistently struggle to attract health care providers of all types. There are a variety of reasons for this: rural pay is typically lower, there is a smaller recruitment pipeline, and it can be a challenge to attract urban residents to relocate and practice in rural areas.

Figure 4 quantifies the urban/rural distribution for licensed mental health providers in Minnesota, and includes all the professions we have studied thus far. Based on data from the four governing health licensing boards, this population-to-provider ratio is a measure of the per capita size of the

workforce, or the population that hypothetically "shares" a single provider within an area. Figure 4 shows that there are 340 people to every one licensed mental health provider in metropolitan areas of Minnesota, compared with nearly 2,000 people to every one licensed mental health provider in rural areas.

In response to this problem, public health stakeholders emphasize the importance of developing their own local pipeline. Among other initiatives, these "grow your own" strategies include developing and offering post-secondary programs in rural regions.

Figure 5 offers some evidence on the likely effectiveness of grow-your-own strategies, showing the employment distribution of those who attended school in the Twin Cities metro versus elsewhere in the state (Greater Minnesota). While the majority (about 74 percent) of mental health students trained in the Twin Cities metropolitan area stay there to work, only about 60 percent of graduates from institutions in Greater Minnesota remain there to work. That is, even given the small share of licensed graduates who attended school at non-Twin Cities institutions (1,765 versus 1,563) Greater Minnesota still loses a higher share of its licensed graduates to Twin Cities employment. This suggests that it will not be enough to simply offer higher education in rural areas. It will also be important to reduce barriers and increase incentives to practice in non-Twin Cities areas, particularly rural areas.

Figure 5. Region of Employment Versus Region of Schooling for Graduates with a Mental Health License

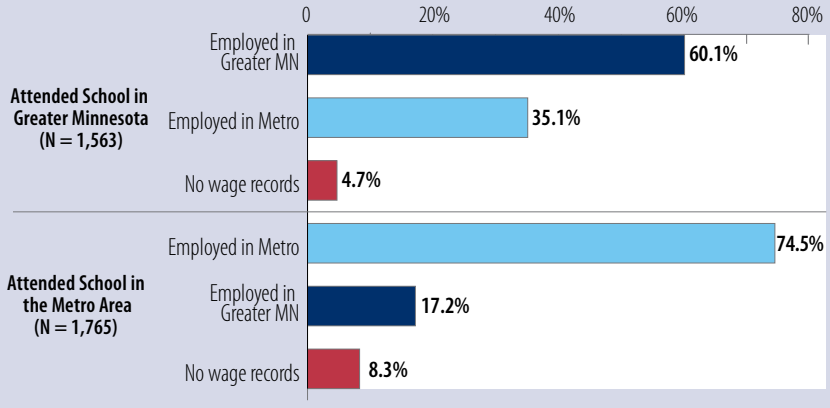


Figure 5 includes licensed graduates aged 20-60 in their third year after graduation.
Source: See "About this Data" on page 8 for additional data details.

Conclusions and Policy Implications

This article identified areas of strength in the mental health educational pipeline and areas of risk.

Strengths:

The first area of strength is the market rewards for licensure. Across the board, licensed mental health providers earn higher wages and have a higher chance of securing stable, full-time employment after graduation compared with others with the same education but no license.

At the same time, even without licensure, graduates in mental health fields find employment in industry settings most highly related to their academic background. Though they cannot legally perform the same scope of work as licensed providers, they should be legitimately counted as part of the mental health workforce.

The second area of potential strength is the popularity of bachelor's programs in psychology and social work. These large programs could sustain future employment growth in the mental health workforce in Minnesota, yet this opportunity is not being leveraged. Only a small fraction of this potential supply goes on to complete graduate training and licensure because of a series of bottlenecks that could be addressed through targeted policies.

Specifically, the findings here lend support to a set of legislative recommendations that resulted from a 2014 mental health workforce task force led by HealthForce Minnesota. Those recommendations included measures to reduce the barriers and burdens associated with clinical and non-clinical supervision, such as creating an institute to provide free supervisor training; creating tax incentives for mental health professionals who offer supervision; and requiring third-party payers to reimburse for the mental health care trainees provide when working under supervision (which they currently do not). Changes such as these would increase the number of working professionals who are willing to offer supervision and potentially reduce or remove the high cost of supervision from students and trainees.

The third area of strength is the expected job growth in mental health careers, especially licensed alcohol and drug counselors, driven by the rising drug epidemic. The data reveal that a bachelor's degree in addiction counseling coupled with an LADC license is a very marketable combination, and these workers are likely to end up in stable, full-time, well-paying positions relative to other mental health bachelor's completers.

Concerns:

There are also areas of specific concern. Even though licensure requires a significant investment of time and money, licensed workers sometimes compete in the market with non-licensed workers with similar levels of training. In some industry sectors, such as nursing and residential care facilities, the wage premium is modest. And regardless of license status, earnings among newly trained mental health individuals are definitely below standard compared with typical wages earned by workers in other health care occupations requiring comparable schooling.

From the perspective of an individual who is making career choices, this certainly reduces the incentive to pursue a professional-level career in mental health. That, in turn, threatens the adequacy and quality of Minnesota's mental health workforce.

Another special area of concern is rural practice. All else being equal, rural providers would have client caseloads of roughly five times the number in urban areas. While offering post-secondary training in Greater Minnesota and rural areas is somewhat effective, Twin Cities employment exerts a strong pull. Just under half of mental health providers educated in Greater Minnesota come to work in the Twin Cities. This suggests that for grow-your-own efforts to be most successful, postsecondary programs in rural areas should be coupled with aggressive efforts to retain workers.

Some rural areas have had success with reaching out to middle school students to get them interested in health careers and with offering health care internship opportunities to college-age students as a way of connecting them to local employers and keeping them tied to the region. The data presented here suggest that creative strategies such as these will be important to retain a strong workforce outside of the Twin Cities.

More broadly, these findings reflect a problem of a higher order: a devaluing of the work of mental health professionals and practitioners. In no other

segment of the health care workforce would licensed workers compete for jobs with non-licensed workers, or earn similar wages even though the level of investment, training and competency was far higher. Simply put, hospitals do not hire non-licensed nurses or doctors, and clinics do not hire non-licensed physical, occupational or respiratory therapists.

On-the-job training is also often less structured in mental health than in other health care occupations, leaving it to students to finance their own on-the-job training on top of their formal academic education. We must ask why standards for mental health care are looser, why the line between licensed and non-licensed work is not brighter, and why these professionals are not valued, supported in their training, or compensated to a level commensurate with their preparation.

A common policy solution to health care workforce shortages is to create new professions with lower levels of education and narrower scopes of practice that can assume some of the duties of the shortage profession. Examples include physician assistants to supplement the physician workforce, and dental therapists to supplement the dentist workforce.

These strategies have been successful in other fields, but the findings here caution against such initiatives in mental health. Such a short-term fix will exacerbate the underlying problem in the long run. There are already thousands of non-licensed workers providing services related to mental health and social service. If licensed mental health professionals are not already established as an integral, well-respected and well-compensated part of the health care team, then a strategic policy of hiring more paraprofessionals will only de-professionalize and further depress wages for the licensed workforce. Instead, long-term strategies should emphasize and preserve the importance of high-quality credentialing and standards for this critically important workforce.

It is clear that the need for highly-trained mental health workers will only increase with our population. This research has contributed to our understanding of how to enumerate, support and grow this important group of workers.

[1]For the purposes of this research, we exclude advanced practice psychiatric nurses and psychiatrists.

[2]Minnesota Statute 245.462, Subd. 16-17.

[3]This includes DEED's 2016 Occupational Employment Statistics counts for psychologists, substance abuse and other types of mental health counselors, marriage and family therapists, and four classifications of social workers. It excludes psychiatrists and psychiatric nurses.

[4]A few educational programs were excluded from this count of graduates because they are not designed to prepare for licensure or for employment in a mental health-related field: educational psychology, vocational rehabilitation counseling, and master's and post-master's psychology programs except those in counselling psychology specifically geared toward licensure.

[5]It is important to note that all three professional-level mental health licenses require nearly identical levels of education, clinical supervision hours and licensure examination. Therefore, though they might have slightly different clinical orientations and foci, these three groups are equally qualified to provide mental health services.

[6]By way of comparison, national data from the Bureau of Labor Statistics show that about 17 percent of all adults age 25 and older worked part-time for any reason in 2016. (Among only women, that share was 27 percent.)

[7]Tracking wages in the fourth year allows enough time for graduates to fulfill the practicum requirements.

John Stevens

Top Jobs for Millennials in Minnesota

Millennials account for 36 percent of the labor force in Minnesota, eclipsing both baby boomers and Generation X.

Minnesota's labor force is undergoing a major shift. As baby boomers (born between 1946 and 1964) continue to leave the workforce, millennials (born between 1981 and 1999)[1] seek to fill the void they are leaving behind.

For millennials in college or for those looking for a new career path, the question becomes what occupations offer the best opportunity for good pay, stability, growth and opportunity. What are the best jobs for millennials? In this article we compile a list of the best jobs for millennials in Minnesota based on wages, projected growth, millennial share of employment and total number of jobs statewide. Further, we break down the best jobs for millennials by educational requirement and area of study or interest.

It's a Millennial's World

The millennial generation is large. As of 2015, millennials accounted for about 25 percent of Minnesota's population and nearly 36 percent of the state's labor force. In fact, millennials now comprise the largest segment of Minnesota's labor force, while Generation X (born between 1965 and 1980) and baby boomer workers comprise approximately 33 and 30 percent of the labor force, respectively.[2]

Fortunately, working-age millennials (ages 25 to 36) are increasingly finding work opportunities statewide, with unemployment rates on par with the average unemployment rate across all working-age groups.[3]

Despite popularly held stereotypes, millennials are proving themselves to be dedicated employees. Across every industry, the working-age millennial turnover rate is never more than three percentage points higher than the turnover rates for all employees.[4]

Moreover, turnover rates for younger workers have actually decreased over the past two decades.

Millennials work throughout Minnesota's industry sectors. Sectors employing the most millennials include accommodation and food services; retail trade; arts, entertainment and recreation; administrative and support services; and health care and social assistance.[5]

Many occupations within these sectors are projected to experience significant growth in the coming years, with some occupations, such as statisticians, home health aides, physician's assistants and biomedical engineers, anticipated to grow by more than 20 percent through 2024.[6] These are promising trends for millennials, especially those who are just entering the workforce and are interested in pursuing STEM (science, technology, engineering and mathematics) or health care occupations. With baby boomers retiring at an increasing pace, career pathways also open up for older millennials looking to advance their skill sets, take on more leadership and earn higher wages.

At one end of the spectrum, industries like retail trade and accommodation and food services attract millennials looking for immediate work with little to no education required. This is perfect for employers desperate for workers in a tight labor market and can be a springboard for millennials to gain job experience.

At the other end of the spectrum, industries like professional, scientific and technical services; finance and insurance; and management push millennials to seek bachelor's and advanced degrees.

Manufacturing and construction are often overlooked by millennials, despite their significant presence in the state economy. For example, manufacturing accounts for 13.6 percent of total state jobs compared with 10.5 percent nationally.[7]

Wages within manufacturing and construction are more than 16 percent higher than wages for the total of all industries.[8] These occupations do not typically require postsecondary education, with apprenticeships and on-the-job training commonplace. Whether it's an electrician, carpenter, welder or CNC operator, construction and manufacturing occupations are in-demand and offer excellent opportunities for millennials.

Methodology

Along with tools provided by DEED, we used data from the Bureau of Labor Statistics and the U.S. Census Bureau to compile the list of top jobs for millennials in Minnesota. To make the list, each occupation had to have at least 5,000 employees statewide and show projected growth between 2014 and 2024. The average annual wage of the occupation had to be higher than the average annual wage across all occupations in Minnesota ($50,243). Finally, the occupation had to have a millennial share that was higher than the average millennial share across all occupations in Minnesota (23 percent). The occupations were then scored based on their rank for each category.

While other factors like job satisfaction and flexibility are important, no standard measures of these job qualities exist.

Using the new Career and Education Explorer tool[9] developed by DEED, each occupation was matched to the most common area of study. In some cases, two areas of study were assigned to an occupation. The most common educational requirement was also assigned to each occupation.

Top Jobs for Millennials

Table 1 lists the top 25 jobs for millennials based on the data sets outlined above. STEM-related occupations dominate the top 25 list, including the top four occupations on the list, with application software developers at the top. All of the STEM-related occupations that appear on the list most commonly require a bachelor's degree and almost always have average annual wages over $70,000.

While health care was only represented twice on the list, it is important to mention. As outlined earlier, health care is a great opportunity for millennials with the time and money to attend college and professional schools. Registered nurses, which appears as the sixth-best job for millennials, accounts for about 13 percent of the total

Table 1. Top 25 Jobs for Millennials

Occupation	Employees	Average Annual Wage	Millennial Share	Growth
Software Developers, Applications	12,950	$93,033	32%	10%
Market Research Analysts and Marketing Specialists	12,090	$68,496	32%	13%
Computer Systems Analysts	15,130	$89,908	26%	18%
Software Developers, Systems Software	9,780	$107,005	32%	4%
Accountants and Auditors	26,550	$70,965	26%	7%
Registered Nurses	59,640	$72,892	24%	12%
Marketing Managers	7,590	$136,727	26%	7%
Financial Analysts	6,020	$87,720	35%	5%
Network and Computer Systems Administrators	8,330	$83,628	29%	4%
General and Operations Managers	38,820	$105,329	23%	4%
Loan Officers	7,370	$76,695	27%	6%
Construction Trades Workers	77,760	$54,254	25%	8%
Plumbers, Pipefitters and Steamfitters	8,630	$66,646	25%	8%
Mechanical Engineers	6,330	$82,328	30%	3%
Electricians	11,240	$59,340	24%	11%
Pharmacists	5,450	$123,123	31%	1%
Police and Sheriff's Patrol Officers	8,790	$59,895	28%	3%
Industrial Engineers	8,250	$87,902	27%	1%
Primary, Secondary and Special Education School Teachers	78,530	$59,297	25%	2%
Operating Engineers and Other Construction Equipment Operators	9,810	$57,928	24%	7%
Claims Adjusters, Examiners and Investigators	5,480	$63,344	28%	1%
Child, Family and School Social Workers	6,550	$57,892	26%	2%
Training and Development Specialists	5,660	$62,236	25%	5%
Plant and System Operators	6,190	$57,307	25%	1%
Paralegals and Legal Assistants	5,070	$54,394	24%	6%

Source: DEED Career and Education Explorer tool, Bureau of Labor Statistics and U.S. Census Bureau.

jobs on the top 25 list. Many health care-related jobs were left off this list because of their relatively small size. Expanding the list to include jobs with over 1,000 employees statewide pushes the number of health care occupations on this list up to 10 of the top 25.

How much education do you need?

Table 2 provides the top jobs for millennials based on five educational requirements, which represent those most frequently required for the job. While average wages generally increase with educational requirement, there are great opportunities for people at all different levels of educational attainment. Most of the top jobs requiring high school or vocational training were construction or trades-related. All of the top jobs for those with an associate degree or above were in health care or STEM-related occupations.

What do you want to study?

The College Board identifies eight major areas of study: arts and humanities, business, health and medicine, multi-interdisciplinary studies, public and social services, STEM, social sciences, and trades and personal services. There were no jobs that met the top jobs requirements in the arts and humanities area of study, and the multi-interdisciplinary area of study was not included in the list.

Of the other categories, the list includes the top three jobs for each area of study. In most instances the jobs on this list are not limited to the area of study outlined; however, the area of study outlined is the most logical or most common route of study for the occupation (see Table 3).

Table 2: Top 3 Jobs for Millennials by Minimum Educational Requirement

Occupation	Most Common Educational Requirement	Employees	Average Annual Wage	Millennial Share	Growth
Brickmasons and Blockmasons	High School or Less	1,340	$66,292	31%	16%
Roofers	High School or Less	2,180	$56,313	33%	9%
Electricians	Vocational Training	11,240	$59,340	24%	11%
Plumbers, Pipefitters and Steamfitters	Vocational Training	8,630	$66,646	25%	8%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Vocational Training	2,790	$54,246	28%	7%
Diagnostic Medical Sonographers	Associate Degree	1,400	$76,219	28%	19%
Registered Nurses	Associate Degree	59,640	$72,892	24%	12%
Dental Hygienists	Associate Degree	4,620	$71,582	27%	12%
Software Developers, Applications	Bachelor's Degree	12,950	$93,033	32%	10%
Computer Systems Analysts	Bachelor's Degree	15,130	$89,908	26%	18%
Biomedical Engineers	Bachelor's Degree	1,100	$99,485	38%	23%
Physician Assistants	Graduate or Professional Degree	2,010	$107,599	39%	25%
Nurse Practitioners	Graduate or Professional Degree	3,290	$105,231	25%	26%
Nurse Anesthetists	Graduate or Professional Degree	1,540	$177,074	26%	14%

Source: DEED Career and Education Explorer tool, Bureau of Labor Statistics and U.S. Census Bureau.

Conclusion

Good opportunities exist across Minnesota for millennials at all educational levels and in most areas of interest. This article presents a set of occupations based on large size, employment growth and above-average wages and share of millennials within the occupation. These lists are meant to provide a starting place for millennials who are thinking about their careers and educational opportunities.

The Career and Education Explorer tool can be used by millennials and anyone else to further explore these and other career opportunities in Minnesota. This article is meant to highlight occupations that provide great opportunities for millennials, especially as this generation becomes more prominent in the Minnesota labor market.

Table 3: Top 3 Jobs for Millennials by Area of Study

Occupation	Area of Study	Employees	Average Annual Wage	Millennial Share	Growth
Market Research Analysts and Marketing Specialists	Business	12,090	$68,496	32%	13%
Marketing Managers	Business	7,590	$136,727	26%	7%
General and Operations Managers	Business	38,820	$105,329	23%	4%
Pharmacists	Health and Medicine	5,450	$123,123	31%	1%
Registered Nurses	Health and Medicine	59,640	$72,892	24%	12%
Dental Hygienists	Health and Medicine	4,620*	$71,582	27%	12%
Police and Sheriff's Patrol Officers	Public and Social Services	8,790	$59,895	28%	3%
Child, Family and School Social Workers	Public and Social Services	6,550	$57,892	26%	2%
Paralegals and Legal Assistants	Public and Social Services	5,070	$54,394	24%	6%
Financial Analysts	Social Sciences	6,020	$87,720	35%	5%
Loan Officers	Social Sciences	7,370	$76,695	27%	6%
Elementary and Middle School Teachers	Social Sciences	27,370	$60,322	24%	2%
Software Developers, Applications	STEM	12,950	$93,033	32%	10%
Software Developers, Systems Software	STEM	9,780	$107,005	32%	4%
Computer Systems Analysts	STEM	15,130	$89,908	26%	18%
Electricians	Trades and Personal Services	11,240	$59,340	24%	11%
Plumbers, Pipefitters and Steamfitters	Trades and Personal Services	8,630	$66,646	25%	8%
Construction Trades Workers	Trades and Personal Services	77,760	$54,254	25%	8%

Source: DEED Career and Education Explorer tool, Bureau of Labor Statistics and U.S. Census Bureau.

[1]Definitions of generational groups may vary across the literature.
[2]2015 American Community Survey Five-Year Estimates, U.S. Census Bureau, https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.
[3]Ibid.
[4]Quarterly Workforce Indicators, U.S. Census Bureau, https://qwiexplorer.ces.census.gov/static/explore.html#x=0&g=0.
[5]Ibid.
[6]Employment Projections, DEED, mn.gov/deed/eo.
[7]Quarterly Workforce Indicators, U.S. Census Bureau, https://qwiexplorer.ces.census.gov/static/explore.html#x=0&g=0.
[8]Quarterly Census of Employment and Wages, DEED, mn.gov/deed/qcew.
[9]https://apps.deed.state.mn.us/lmi/cpt/.

Sanjukta Chaudhuri

The Gender Wage Gap

Full-time female workers in Minnesota earn less than their male counterparts in all 20 industries that were examined.

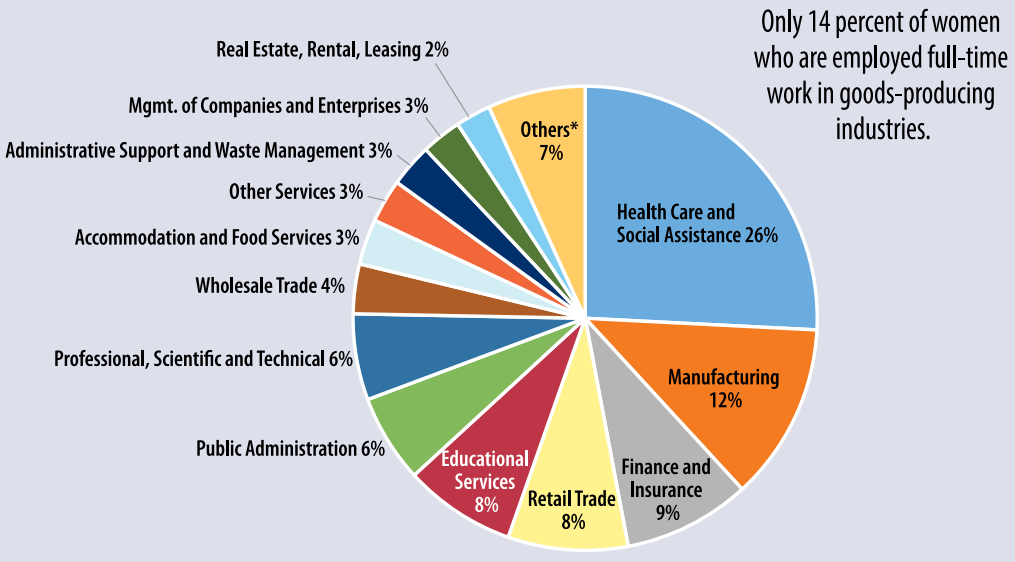
Minnesota regularly ranks as a top state for women to live and work. A 2017 study by WalletHub rated Minnesota as the best state for women in terms of economic and social well-being.

Still, women in Minnesota earn less than their male counterparts, despite comprising 51.2 percent of the workforce. In 2015, the median hourly wage rate was $16.75 for women and $20 for men. This means that, at the median, women earned only 84 percent of men on an hourly basis.

Women, however, are more likely to work part time than men – a median of 384 hours per quarter compared with 480 hours per quarter for men. While this may explain some of the difference in hourly wage (full-time jobs tend to pay more), full-time female workers still earn only 85.5 percent of their male counterparts.

How does this 14.5 percent wage gap break down by industry? To

Figure 1. Distribution of Women Employed Full-Time by Industry in 2015, Minnesota (ages 25-65 years)



(G) Denotes goods-producing industry sector.

*The "Others" category includes transportation and warehousing; information; construction (G); arts and entertainment; agriculture (G), forestry, fishing and hunting (G); utilities; and mining, quarrying, and oil and gas extraction (G).

begin to explore this question, this article provides an industry level analysis using the 20 aggregated NAICS industrial sectors.[1] Only full-time workers between ages 25 and 65 are included in the analysis to ensure that the focus is on a relatively stable and established portion of the workforce.

The data source for this article is a statewide dataset called the Quarterly Employment Dynamics, which was recently developed cooperatively by DEED and the Minnesota Department of Public Safety. The article presents statewide data for 2015, the most recent year for which complete data are available.

Industry profile

In Minnesota, 84 percent of women work full time in service-producing industries, while only 14 percent work in goods-producing industries (see Figure 1).

Over a quarter of women are employed in health care and social assistance, making this the dominant industry for employing women. Manufacturing comes in second (12 percent), followed by finance and insurance (9 percent), retail trade (8 percent), educational services (8 percent), professional, scientific and technical services (6 percent) and public administration (6 percent). Women comprise the majority of the workforce in four service-providing industries: health care and social assistance (74 percent are women), finance and insurance (59 percent), educational services (59 percent), and management of companies and enterprises (52 percent).

Gender Wage Ratios by Industry

Table 1 shows a breakdown of median wages for men and women in the 20 industries that were analyzed. In every instance, women's median wage rates are lower than men's, with the gender wage ratio ranging from 95.5 percent in arts, entertainment and recreation to 64.2 percent in finance and insurance.

At the high end, the all-worker median wage rate is $38.66 hourly in utilities, $36.07 in management of companies and enterprises, $34.93 in professional, scientific and technical services, $33.32 in finance and insurance, and $32 in information.

At the low end, median wage rates are $19.89 in administrative and support and waste

management services, $19.15 in retail trade, $17.47 in agriculture, and $15.65 in accommodation and food services.

Wage Rates and Gender Wage Ratios

Figure 2 shows the scatter plot between median wage rate and gender wage ratios. The trend line shows a negative relationship between the two, meaning that women's wage rates as a percentage of men's wage rates decrease as the overall median wage rate increases.

Take the utilities sector as an example. While the all-worker median wage rate in this sector is $38.66, the median wage rate is $28.33 for women and $40.43 for men, leading to a gender wage ratio of 70.1 percent.

Other high-wage industries with high wage inequity include management of companies and enterprises (77.3 percent), professional, scientific and technical services (75 percent), finance and insurance (64.2 percent), and information (78.5 percent).

Table 1. Gender Wage Ratios by Industry, Full-time Workers Age 25 to 65, Minnesota, 2015

NAICS Code	Industry	All-worker Median Wage Rate ($)	Male Median Wage Rate ($)	Female Median Wage Rate ($)	Gender Wage Ratio (%)	Gender Wage Gap (%)
0	**All Industries**	**25.30**	**27.00**	**23.08**	**85.5**	**-14.5**
11	Agriculture, Forestry, Fishing and Hunting	17.47	17.75	16.19	91.2	-8.8
21	Mining, Quarrying, and Oil and Gas Extraction	29.64	29.81	27.45	92.1	-7.9
22	Utilities	38.66	40.43	28.33	70.1	-29.9
23	Construction	29.14	29.99	23.96	79.9	-20.1
31-33	Manufacturing	23.78	24.82	20.82	83.9	-16.1
42	Wholesale trade	27.09	27.64	25.57	92.6	-7.5
44-45	Retail Trade	19.15	20.60	17.11	83.1	-16.9
48-49	Transportation and Warehousing	22.53	23.04	20.63	89.6	-10.5
51	Information	32.00	34.98	27.45	78.5	-21.5
52	Finance and Insurance	33.32	43.37	27.79	64.2	-35.9
53	Real Estate and Rental and Leasing	26.71	27.99	25.66	91.8	-8.3
54	Professional, Scientific and Technical Services	34.93	39.34	29.49	75.0	-25.0
55	Management of Companies and Enterprises	36.07	41.15	31.80	77.3	-22.7
56	Administrative and Support and Waste Management Services	19.89	20.54	18.73	91.2	-8.8
61	Educational Services	24.74	25.74	23.98	93.2	-6.8
62	Health Care and Social Assistance	22.05	25.85	21.08	81.7	-18.5
71	Arts, Entertainment and Recreation	20.31	20.69	19.77	95.5	-4.4
72	Accommodation and Food Services	15.65	16.01	15.2	94.9	-5.1
81	Other Services, Except Public Administration	21.46	23.37	18.93	81.0	-19.0
92	Public Administration	28.02	29.29	26.45	90.3	-9.7

Source: Quarterly Employment Dynamics

On the other hand, some of the lower-paying industries have relatively lower pay inequity, including art, entertainment and recreation (95.5 percent) administrative and support and waste management (91.2 percent) and accommodation and food services (94.9 percent).

Wage Inequality and Share of Women

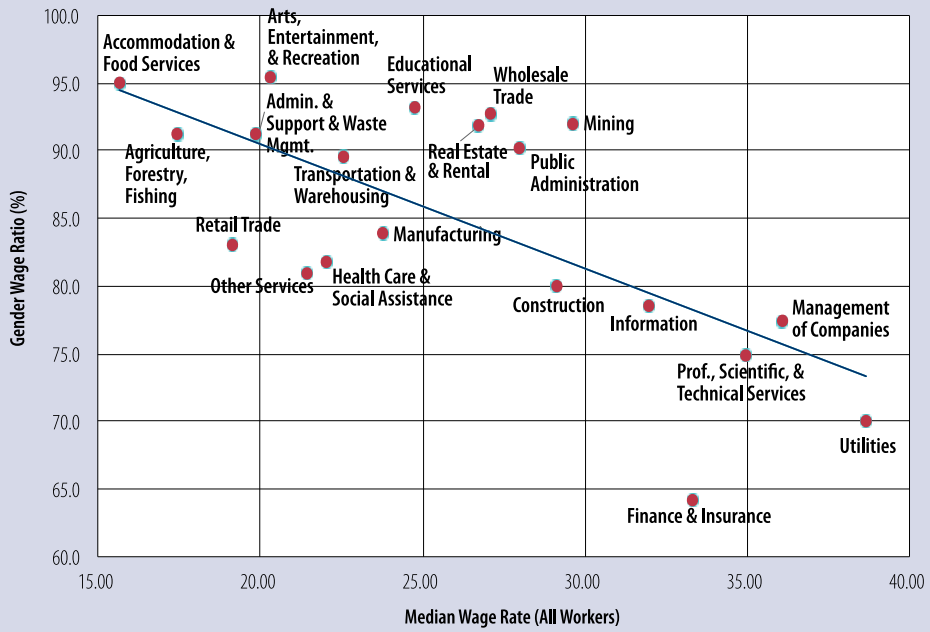
Figure 3 shows that as the share of women increases within an industry, gender wage ratios tend to worsen as illustrated by the negatively sloped trend line. Three out of four of the female-majority industries are characterized by high wage inequality including health care and social assistance (81.7 percent), finance and insurance (64.2 percent), and management of companies and enterprises (77.3 percent).

Making Sense of the Statistics

One practical application of these statistics is to help women make career decisions. Career choice naturally depends on a host of factors, including individual preferences, human capital and other life circumstances.

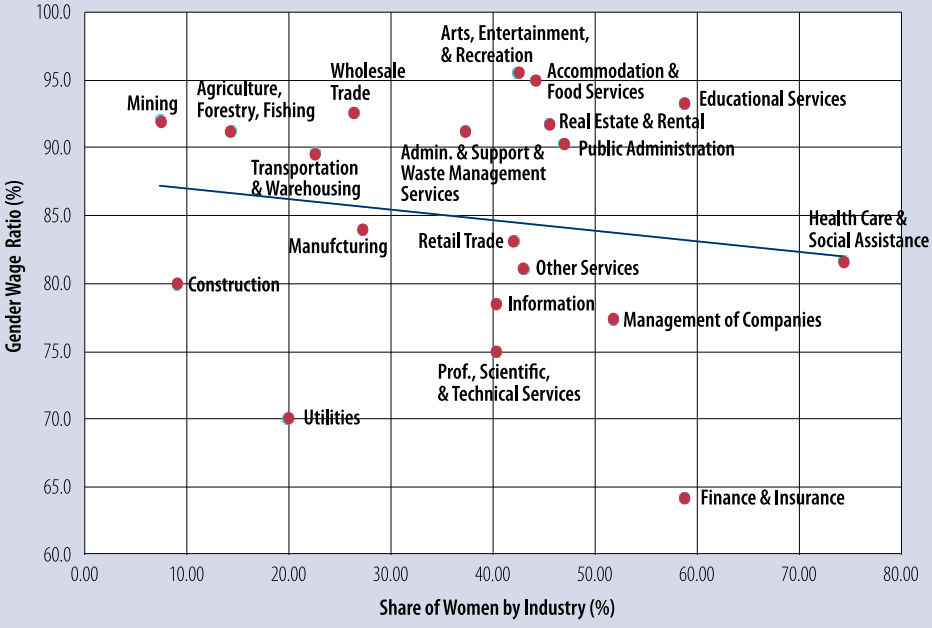
Based on the previous analysis, however, and setting aside all other considerations, if we were to rank industries by what

Figure 2. Wage Rates and Gender Wage Ratios



Source: Quarterly Employment Dynamics

Figure 3. Wage Inequality and Share of Women



Source: Quarterly Employment Dynamics

women value most in a job, then the potential priorities driving choice of industry might be some combination of high wages and high-wage equality within the industry, and a high share of women in the industry to facilitate positive role modeling and mentoring.

Table 2 offers a short list of industries based on these hypothetical priorities and shows the main trade-offs to take into account. Unfortunately, no industry offers everything, and every industry involves trade-offs for women. A high-wage industry such as finance and insurance is plagued by high wage inequality; a female majority industry such as educational services may have ample female role models and mentors but is not a high-wage industry.

Conclusion

How do we unpack the gender wage gap that persists in all industries, even the ones in which women are a majority?

There are various research directions one could take from here. For one, in-depth analysis of disaggregated industries will provide further nuances of wages and gender gaps. Second, industry level analyses hide the occupational differences in wage rates that might be a major underlying cause of the overall wage gap. Third, in order to fully understand the sources of wage gaps, we need to examine several other factors, including human capital differences (educational attainment, skills, relevant experience, productivity, tenure) between men and women; differences between labor market and family choices (college major, industry and occupation, family formation, breaks from workforce to raise family); and systemic issues such as lower rewards for equal work, career stalling, marriage and family penalty, glass ceilings, subtle prejudices and stereotyping.

Watch for further articles on this topic in Trends and Minnesota Employment Review.

Table 2. Potential Priorities and Trade-offs for Women in Minnesota

High Wage Rate	Higher Wage Equality	Predominantly Female Co-workers
Finance and Insurance[1]	Arts, Entertainment and Recreation[3,4]	Health Care and Social Assistance[1]
Utilities[1, 2, 4]	Accommodation and Food Services[3,4]	Finance and Insurance[1]
Professional, Scientific and Technical Services[1]	Educational Services[3]	Management of Companies and Enterprises[1, 4]
Management of Companies and Enterprises[1, 4]		Educational Services[3]
Information[1, 4]		

Main trade-offs:

[1]Higher wage inequality
[2] Women comprise small share of workers
[3]Relatively lower wage rate
[4]Relatively less popular choice among women

[1]NAICS stands for North American Industry Classification System. This industry taxonomy was developed collboratively by the U.S., Mexico and Canada to provide a consistent framework for the collection, analysis and dissemination of industrial statistics.

Dave Senf

A Look at Minnesota Income

Minnesotans enjoy per capita income that is 13.3 percent higher than the national average. This article breaks down the sources of that income.

Minnesota's share of U.S. income, as measured by the American Community Survey (ACS), reached its highest level in 2014 before slipping slightly in 2015. The 2016 income numbers are due out in September, so stay tuned to see how the state fared in 2016.

The ACS income data, available since 2005, is one of three aggregated measures of income that are useful in tracking relative economic progress across states.[1]

The ACS income data are based on household surveys and not administration records, such as income tax and unemployment insurance records used by the two other income estimates. Responses to two questions in the American Community Survey are added up to produce income estimates across various geographic areas. The first question asks about total income over the last 12 months, while the other question asks about the sources of the income.

According to the ACS, the estimated aggregated income of Minnesotans in 2015 was $179.3 billion, putting the state 16th among states even though Minnesota ranked 21st in population.

Minnesota's total income topped Arizona, Indiana, Tennessee, Missouri and Wisconsin, which each have more residents than Minnesota. Minnesota's share of U.S. income was 1.94 percent in 2015, while the state's population share was 1.71 percent. That translates into Minnesota having 13.3 percent more income per person than the average U.S. person.

Another way of looking at the income data without thinking about Minnesota's share of national income and population is to directly compare per capita incomes. The 2015 ACS estimates of per capita income in Minnesota and the U.S. were $32,699 and $28,872, respectively.[2] As with the share approach, Minnesota's per capita income in 2015 was 13.3 percent higher than the nationwide per capita income. Minnesota's per capita income was 11 percent higher than the national average in 2005 and rose to 14.8 percent higher in 2014, before backing off to 13.3 percent higher in 2015, according to the ACS figures.

Types of Income Included in ACS Income Estimates

Wage or Salary Income: Total money earnings received for work as an employee. Includes wages, salary, commissions, tips and cash bonuses earned before any deductions.

Self-Employment Income: Net money income (gross receipts minus operation expenses) for individuals operating a farm as an owner, renter or sharecropper. Also includes net money income (gross receipts minus operation expenses) from one's own business, professional enterprise or partnership.

Interest, Dividends, Net Rental Income: Interest on savings or bonds, dividends from stockholdings, net income from rental of property to others. Does not include realized capital gains.

Social Security Income: Social Security pensions and survivor benefits, prior to deductions for medical insurance and railroad retirement insurance checks from the U.S. government. Medical reimbursements are not included.

Public Assistance Income: General assistance and Temporary Assistance to Needy Families. Does not include noncash benefits such as Supplemental Nutrition Assistance Program payments, energy assistance or Medicaid or Medicare reimbursements.

Retirement Income: Retirement income from company pension, union pension, government pension, military pension and U.S. Railroad pension. Retirement income from Keogh Plan, Simplified Employee Pension and any other type of pension, retirement account or annuity such as IRA, Roth IRA, 401(k), 403(b) account.

Supplemental Security Income: Survivor income that is paid to spouses or children of a deceased person or regular income from a disability pension paid to those unable to work due to disability, from companies or unions, federal, state or local governments, and the U.S. military. Does not include Social Security payments.

All Other Types of Income: Includes unemployment compensation, workers' compensation, Veterans Affairs payment, alimony and child support.

Source: American Community Survey and Puerto Rico Community Survey 2015 Subject Definitions, page 80.
https://www2.census.gov/programs-surveys/acs/tech_docs/subject_definitions/2015_ACSSubjectDefinitions.pdf

The state's per capita income using ACS income numbers declined during the recession in 2009 and 2010, before accounting for inflation. After adjusting for inflation, real per capita income in Minnesota declined for three straight years, 2009 through 2011. Real per capita income in 2011 was 7.3 percent below the 2008 peak, or about $2,400 less.

Real per capita income in Minnesota has been gradually recovering since 2011. As of 2015, however, it was still 0.3 percent short of the peak in 2008, or about $90 less. The best guess is that when 2016 data are available, real per capita income will finally have moved higher than the 2008 peak.

Real per capita income for the U.S. peaked in 2007 and fell through 2012, dropping by 7.8 percent. U.S. real per capita income in 2015 was still 2.4 percent below the 2007 peak level, or about $630 lower.

So why was Minnesota 2015 per capita income $3,826 higher than U.S. per capita income? Did Minnesotans make more money in the stock market, receive more Social Security, have higher wages, or collect more public assistance than the average American?

Part of the answer is provided in the ACS income data, which break down income sources into eight broad categories. In Minnesota, as in all states, the most important source of income is paychecks. Wage and salary income accounted for 77 percent of Minnesotans' income in 2015 as shown in Table 1. Social Security was the second-largest income source for Minnesotans, followed by investment, dividends and net rental income, self-employment income and retirement income. The other three sources provide a small proportion of income, accounting for just over 2 percent when combined.

The sources of household income in Minnesota aren't all that different from U.S. households. The one noticeable difference is that Minnesota households receive more of their income from wage and salary income than U.S. households. Wage and salary income accounted for 77 percent of Minnesota income in 2015 compared with 74.3 percent in the U.S. Social Security income, interest, dividend or net rental income, and retirement income account for a larger share of income nationally than in Minnesota.

Minnesota ranked seventh in the share of state total income generated by wage and salary income in 2015. Minnesota's average wage is slightly higher than the average U.S. wage. But more important in explaining Minnesota's higher share of income from wage and salary income is that a larger share of working-age Minnesotans earns paychecks compared with the rest of the country. A lower unemployment rate and significantly higher labor force participation rate boost wage and salary income share in the state above the national norm.

Table 2 lists Minnesota's ranking, in terms of each income category's share of state income, for the six highest income sources. Minnesota's rank is

Table 1. 2015 Aggregate Minnesota Household Income in the Past 12 Months (in 2015 inflation-adjusted dollars)

Income Source	Minnesota 2015 Income (Billions of 2015 Dollars)	Minnesota Percent of State Income	U.S. Percent of National Income
Total Household Income	**$179.27**		
Wage or Salary	$138.10	77.0	74.3
Social Security	$11.72	6.5	7.2
Interest, Dividends or Net Rental	$8.98	5.0	5.5
Self-Employment	$8.47	4.7	4.8
Retirement	$8.26	4.6	5.9
Other Types of Income	$2.65	1.5	1.6
Supplemental Security	$0.87	0.5	0.7
Public Assistance	$0.21	0.1	0.1

Source: American Community Survey, 2015.

listed along with the top and bottom three states and the U.S. average share.[3]

The state rankings when examined closely reveal a lot about the economic structure of states. For instance West Virginia, Florida and Montana are ranked at the bottom when it comes to wage and salary income as a percent of total state income. West Virginia and Florida are near the top when in it comes to reliance on Social Security. These states have relatively older populations. Thus a higher percentage of their populations is composed of senior citizens collecting Social Security and not active in the workforce.

Montana, on the other hand, is one of the leading states when it comes to self-employment income. Higher self-employment income shares of total state

Table 2. State Ranking of Share of State Total Income by Income Sources

Rank	Wage and Salary Share	Percent
1	NJ	78.4
2	UT	77.8
3	MD	77.8
7	**MN**	**77.0**
	U.S. Average	74.3
49	WV	68.3
50	FL	67.8
51	MT	66.9

Rank	Social Security	Percent
1	WV	13.0
2	AR	10.5
3	MS	10.3
	U.S. Average	7.2
35	**MN**	**6.5**
49	MD	5.2
50	AK	3.6
51	DC	2.5

Rank	Interest, Dividends, or Net Rental	Percent
1	ND	8.7
2	FL	8.0
3	DC	7.8
	U.S. Average	5.5
32	**MN**	**5.0**
49	OH	4.0
50	WV	3.5
51	MS	3.3

Rank	Self-Employment	Percent
1	SD	9.9
2	ND	9.6
3	MT	7.0
	U.S. Average	4.8
24	**MN**	**4.7**
49	AL	3.5
50	WV	3.4
51	DE	3.3

Rank	Retirement	Percent
1	NM	8.8
2	AL	8.0
3	DE	8.0
	U.S. Average	5.9
48	**MN**	**4.6**
49	TX	4.5
50	NE	4.5
51	ND	3.4

Rank	Other Types of Income	Percent
1	AK	3.0
2	WV	2.7
3	NM	2.4
	U.S. Average	1.6
38	**MN**	**1.5**
49	NJ	1.3
50	NY	1.2
51	DC	0.8

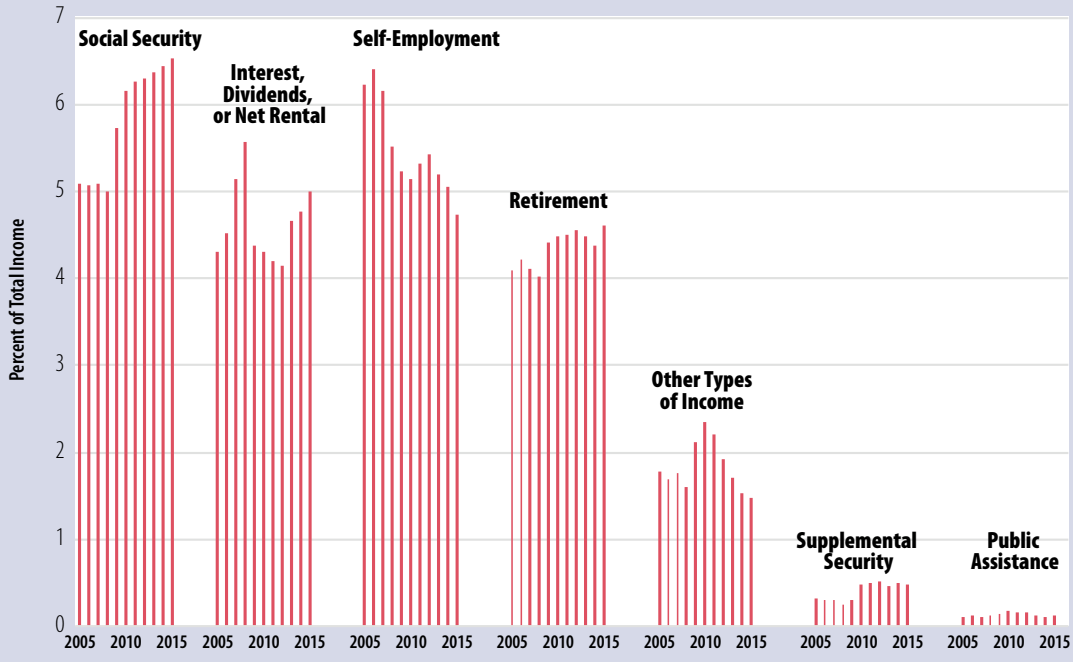
Source: American Community Survey, 2015.

income tend to correlate with states where agriculture is a dominant industry. North Dakota is the top state for share of income coming from interest, dividends and net rentals. Included in this category is royalties. Oil royalties combined with farmland rentals probably account for most of North Dakota's lead position in this income category. Alaska ranks near the top most years for other types of income per capita because of the Alaska Permanent Fund. If you know any Alaskans, you know how they eagerly await their annual Permanent Fund dividend that was just over $2,000 per person in 2015.

Tracking different income categories over time is a useful exercise for understanding how state economies are changing, especially relative to each other. Nevada is the only state where the per capita income level (not adjusted for inflation) is still below its pre-recession peak. States that have just barely rebounded above their pre-recession peak per capita income include Arizona, Georgia, Florida and Idaho. North Dakota, on the other hand, barely felt the Great Recession during its oil fracking boom. North Dakota's per capita income dropped only in 2010 and increased by 54 percent between 2005 and 2015, moving the state from 33rd in 2005 to seventh in 2015. Minnesota's per capita income climbed 25.3 percent during the same 10 years, slipping from seventh in 2005 to 11th in 2015.

Figure 1 displays how income sources for Minnesota households have ebbed and flowed over the last 10 years using the share of state income measure. The share of wage and salary income isn't shown, but as with the U.S. wage and salary share it has been gradually declining. The 2005 share of income from wages and salaries was 78 percent and 75.6 percent for Minnesota and the U.S., respectively. The

Figure 1. Minnesota Income by Source, 2005-2015
(percent of total income, excludes wage and salary)



Source: American Community Survey, 2005-2015

2015 shares were down to 77 percent for Minnesota and 74.3 percent for the U.S. Over the 10 years, Minnesota's share of wage and salary edged down one percentage point, while nationally the share declined 1.3 percentage points. Income from self-employment has also been declining relative to total income over the last decade.

Social Security income and retirement income have been gaining in importance, especially since the Great Recession. It is hard to say how much of that is due to early retirement related to job loss during the recession versus the gradual acceleration in baby boomers retiring.

Social Security income accounted for 9.9 percent of household income in Florida in 2015, due primarily to 19.5 percent of Floridians being older than 64 years. Minnesota's senior citizens accounted for 14.6 percent of the population in 2015 and are projected to reach 19.3 percent by 2025. Minnesota's percent of household income arising from Social Security will likely be approaching Florida's current 9.9 percent by 2025.

The increase and decrease in other types of income as a percent of household income in Minnesota between 2008 and 2013 mainly tracks with changes in unemployment compensation received by Minnesota households. The number of unemployed Minnesotans peaked in 2009 at 229,000, after climbing from 117,000 in 2005. The average annual number of unemployed in 2015 was down to 110,000. Roughly 0.8 percent of Minnesota's income in 2009 and 2010 stemmed from unemployment compensation designed to offset lost wage and salary income during downturns. Public assistance income also rose during the recession but has since reverted to its pre-recession level of 0.1 percent of total household income in Minnesota.

Tracking annual changes in ACS estimates of Minnesota households is another tool in understanding how the Minnesota economy works and how well it is performing, especially compared with the national economy and other states. Minnesota, based on ACS income data as of 2015, took less of a hit from the recession and has put it in the rearview mirror faster than most states.

[1]The three income datasets are the ACS's money income data, the Bureau of Economic Analysis personal income data, and the IRS adjusted gross income data. Due to different concepts of income, the three income estimates differ significantly.

[2]Source: Author's calculations using American Community Survey household income estimates. Per capita income estimates presented here differ slightly from ACS per capita income estimates due to use of differing population estimates used in per capita calculations.

[3]ACS income data for total income and the eight income categories by state for 2005 – 2015 are shown graphically using four views: actual income, percent of state total income, share of U.S. income and per capita at https://public.tableau.com/profile/magda.olson#!/vizhome/SourcesofHouseholdIncomebyState/Sheet1.

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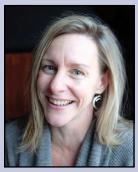

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