

Research on the Supply and Demand of Nurse Practitioners and Physicians Assistants in Western Massachusetts

November 2018

The Western Massachusetts

Nursing Collaborative

Advancing Nursing  *Addressing Critical Needs*

Prepared by the Western MA Nursing Collaborative, a program
of the Healthcare Workforce Partnership of Western
Massachusetts

WesternMassHealthCareers.org

Finding Your Calling in Western Massachusetts

**THE HEALTHCARE WORKFORCE PARTNERSHIP OF WESTERN MASSACHUSETTS IS AN INITIATIVE OF THE
MASS HIRE HAMPDEN COUNTY WORKFORCE BOARD, INC.**

Contents

About the Collaborative.....	4
Introduction.....	5
Survey Methodology.....	5
Summary of Findings.....	6
Regional Industry Demand.....	7
Academic Institutions Supply Data.....	10
Survey Results from Healthcare Service Organizations in Western Mass.	12
Survey Results from NP Programs in Western Mass.....	17

About the Collaborative

Established in 2006, the Western Massachusetts Nursing Collaborative (WMNC) is a coalition of nurse leaders from academia, healthcare service organizations professional associations and chapter organizations in Western Massachusetts focused on the critical role the nursing workforce plays in the delivery of quality patient care. The WMNC is working to ensure Western Mass has an adequate supply of high quality, diverse nurses to meet the healthcare needs in our region. Below is the current strategic plan goals of the WMNC.

The 2016 – 2019 WMNC Strategic Plan Goals are to:

1. *Increase the diversity of the nursing workforce* by increasing employment of nurses of diverse backgrounds and preparing student of diverse backgrounds for the rigors of nursing programs.
2. *Ensure nurses have the competencies and full scope of practice to meet the health needs of the community* by increasing hiring in high demand settings, providing nurses with competencies to lead and improve patient-centered care transitions and integrating high priority competencies into educational programs.
3. *Increase the number of nurses with advanced degrees* by promoting accelerated educational pathways, supporting nurses in nurse practitioner programs and increasing knowledge of financing options.
4. *Increase the supply and diversity of nursing faculty in Western Mass* by motivating nurses to explore faculty roles, utilizing innovative utilizing innovative compensation strategies, increasing recruitment and retention.
5. *Increase retention in all healthcare settings* by utilizing evidence-based retention programs and increasing access to professional advancement opportunities.
6. *Sustain the growth and development of the Partnership to implement its goals* by including more cross-continuum partners and associations, leveraging partner co-investment and funding from public and private sector investment in nursing and aligning with national and state-wide nursing organizations.

Introduction

In 2017, a sub-group of the WMNC which consisted of representatives from healthcare service organizations that employ NPs and academic institutions with NP programs was formed to address the concerns regarding educating and employing new nurse practitioners. The group identified the following four objectives:

1. Forecast the regional future demand for NPs
2. Determine suitable academic admission and graduation targets
3. Develop collaborative strategies to address clinical placements for NPs
4. Create, expand and educate employers on on-the-job training opportunities for new graduates.

The role and practice similarities between nurse practitioners (NPs) and physician assistants (PAs), as well as the service organizations' propensity to interchange open mid-level clinical practitioner positions between NP or PA candidates impacted the decision to collect data on both professions.

Survey Methodology

The group initially reviewed state reported data on the demand and supply of nurse practitioners in Western Massachusetts. The healthcare service organizations believed that the actual demand for NPs is much higher than the numbers reported by the state and expressed the need for additional research. To this end, the WMNC created and disseminated a survey to service providers aimed at quantifying and assessing the need for NPs and PAs; and a separate survey was distributed to the educational programs simultaneously to assess student profiles and enrollment constraints.

The survey, entitled *Employment and Retention of Nurse Practitioners and Physicians Assistants in Western MA* was distributed electronically to 20 healthcare service organizations in December 2017. The response deadline was extended several times in early 2018 and was closed in early March. Eight healthcare service organizations, representing approximately 69 clinical sites completed the survey. These organizations are: *Baystate Health, Inc., CleanSlate Centers, Commonwealth Care Alliance & Commonwealth Community Care, Cooley Dickinson Healthcare, Mercy Medical Center and Affiliates, New England Geriatrics, River Valley Counseling Center, and Shriners Hospital for Children-Springfield*. The second survey was sent to the three academic institutions with nurse practitioner programs. All three institutions (American International College (AIC), Elms College and University of Massachusetts, Amherst (UMass, Amherst) completed the survey.

In addition to the survey results from the healthcare service organizations and the academic institutions, the Mass Hire Hampden County Workforce Board (MHHCWB) collected additional data from federal and private sources to expand on the overall supply, demand and projected job growth for nurse practitioners and physician assistants in the Five Region Area: Hartford, Worcester, Hampden, Hampshire and Franklin Counties.

Summary of Findings

There has been an increase in the number of nurse practitioner (NP) programs in Western Mass. This growth in NP programs, aligns with the Western Massachusetts Nursing Collaborative (WMNC) goal of increasing the supply of available NP candidates to fill vacant primary and specialty care positions. But the expansion and development of new programs is dependent not only on the demand for practitioners but also on the availability of clinical placement opportunities at the healthcare service organizations.

- The posting intensity for NPs and PAs are high in the five region area. There is an average of 7 postings for every NP and 6 postings for every PA job opening. This indicates that the organizations are having a difficult time finding available candidates for open positions.
- There were 322 unique job postings for NPs from July 2017 to June 2018 and 262 unique job postings for PAs.
- The demand for nurse practitioners and physician assistants is projected to increase by 13% by 2018 in Western Mass. This is an increase of 10 new positions for NPs and 8 new positions for PAs.
- There is a projected increase in the demand for nurse practitioners by 14% and 13% for physician assistants in the five region area. This is an increase of 45 new positions for NPs and 34 new positions for PAs.
- The academic institutions in Western Mass graduated 208 NPs and 167 PAs between 2015-2017.
- The schools in the five region area graduated 531 NPs and 855 PAs between 2015- 2017.
- There is a limited increase in the number of new graduates in western Mass and the five region area.
- The academic programs noted that their only constraints for enrolling students into NP programs is the limited number of available clinical placement opportunities.

Regional Industry Demand

The Mass Hire Hampden County Workforce Board (MHHCWB) gathered data from several sources to capture real-time job posting information, new supply of NP and PA practitioners and projected job growth for both professions. The tables and charts in this section provide data from the counties in the *Five Region Area: Hartford, Worcester, Hampden, Hampshire and Franklin Counties*.

Table 1: Top Organizations Postings – Five Counties – Nurse Practitioners

Table 1 shows the 15 organizations in the five region area with the most job postings within the past year, specifically Jul 2017-Jun 2018. None of the organizations that are listed below completed the survey that was distributed employers.

	Company	Total Postings (Jul 2017-Jun 2018)	Unique Postings (Jul 2017 - Jun 2018)	Median Posting Duration
1	CVS Health Corporation	281	41	85 days
2	MinuteClinic, L.L.C.	290	34	63 days
3	New England Home Health Care (Nehc LLC)	396	32	25 days
4	UnitedHealth Group Inc.	163	20	67 days
6	Hartford Healthcare Corporation	56	16	15 days
7	MedExpress	124	13	40 days
8	UMass Memorial Health Care Inc.	207	13	122 days
9	Ideal Image Development, Inc.	39	7	29 days
10	Matrix Medical Network	40	7	175 days
11	Anthem, Inc.	17	6	18 days
12	Risk Adjustment Management LLC	30	6	4 days
13	United States Department of the Air Force	12	6	4 days
14	Signify Health (Advance Health)	14	5	24 days
15	Harrington Memorial Hospital, Inc.	13	5	17 days

EMSI Workforce Analysis Report: Job Posting Analytics 1483, 4066, 4723, 4851

Findings:

- There were a total of 2,104 total job postings from July 2017 to June 2018, of which 322 were unique.
- These numbers shows a posting intensity of 7-to-1, meaning that for every 7 postings there is 1 unique job posting.
- This is higher than the posting intensity for all other occupations and organizations in the region (4-to-1), indicating that they may be trying harder to hire for this position

Table 2: Unique Job Postings – Five Counties – Nurse Practitioners

Table 2 shows unique job postings in the five counties during the same time period (*Jul 2017 - Jun 2018*). Hartford and Worcester Counties show the most unique job posting during this period, that is a combined total of over 75% of the total job postings.

County	Unique Postings (Jul 2017 - Jun 2018)
Hartford County, CT	158
Hampden County, MA	42
Hampshire County, MA	23
Franklin County, MA	10
Worcester County, MA	89

EMSI Workforce Analysis Report: Job Posting Analytics 1483, 4066, 4723, 4851

Table 3: Top Organizations Postings – Five Counties – Physician Assistants

Table 3 shows the 15 organizations in the five region area with the most job postings within the past year (Jul 2017 - Jun 2018).

	Company	Total Postings (Jul 2017-Jun 2018)	Unique Postings (Jul 2017 - Jun 2018)	Median Posting Duration
1	Hartford Healthcare Corporation	108	20	47 days
2	MedExpress	114	16	45 days
3	UnitedHealth Group Inc.	74	11	33 days
4	UMass Memorial Health Care Inc.	81	10	58 days
6	Community Health Center	40	10	28 days
7	Care.com, Inc.	146	7	2 days
8	Urgent Care	42	7	60 days
9	New England Home Health Care (Nehc LLC)	35	4	64 days
10	The William W Backus Hospital	47	4	101 days
11	Town & Country Pediatrics and Family Medicine	21	4	60 days
12	Trinity Health Corporation	14	4	86 days
13	Baystate Medical Center, Inc.	12	3	n/a
14	Connecticut Children's Medical Center	34	3	50 days
15	Eastern Connecticut Health Network, Inc.	150	3	208 days

EMSI Workforce Analysis Report: Job Posting Analytics 1483, 4066, 4723, 4851

Findings:

- There were a total of 1,522 total job postings from July 2017 to June 2018, of which 262 were unique.
- These numbers shows a posting intensity of 6-to-1, meaning that for every 6 postings there is 1 unique job posting.
- This is higher than the posting intensity for all other occupations and organizations in the region (4-to-1), indicating that they may be trying harder to hire for this position.

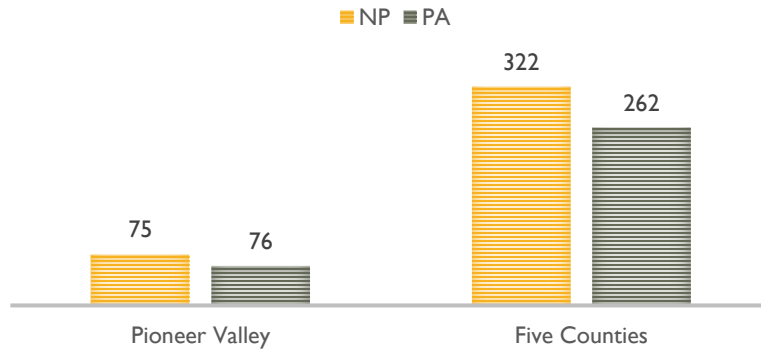
Table 4: Unique Job Postings – Five Counties – Physician Assistants

Table 4 shows 262 unique job postings in the five region area. Hartford and Hampden counties show the most unique job posting during this period.

County	Unique Postings (Jul 2017 - Jun 2018)
Hartford County, CT	153
Hampden County, MA	66
Hampshire County, MA	9
Franklin County, MA	1
Worcester County, MA	33

EMSI Workforce Analysis Report: Job Posting Analytics 1483, 4066, 4723, 485

Chart 1: Demand of NPs and PAs in 2017

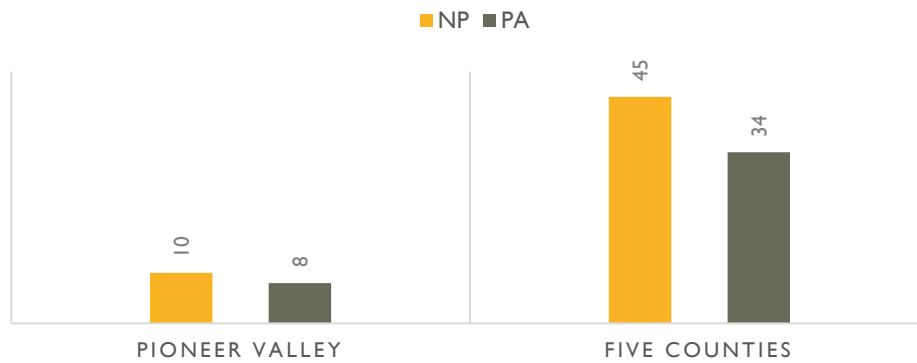


EMSI Workforce Job Posting Analytics

Findings:

- There were 75 unique postings for nurse practitioners and 76 unique postings for physician assistants in Western Mass.
- In the five region area, there were 322 unique postings for nurse practitioners and 262 unique postings for physician assistants.

Chart 2: Projected Job Growth 2018-2024



Findings:

- The demand for nurse practitioners and physician assistants is projected to increase by 13% by 2018 in Western Mass. That is an increase of 10 new positions for NPs and 8 new positions for PAs.
- There is a projected increase in the demand for nurse practitioners by 14% and 13% for physician assistants in the five region area. That is an increase of 45 new positions for NPs and 34 new positions for PAs.

Academic Institutions Supply Data

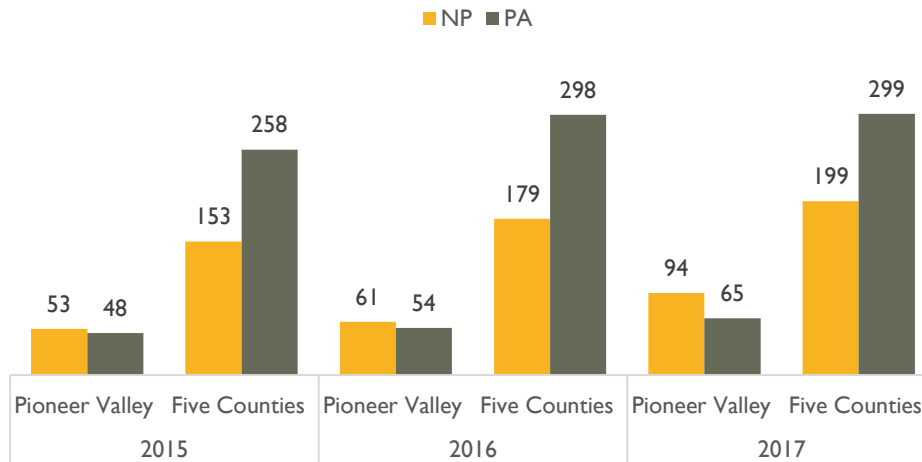
Table 5: Academic Institutions with PA & NP Programs

The table below shows the list of schools within the five region area with NP and PA programs.

	School	County	Program	Status	Graduated 2017	Graduated 2016	Graduated 2015
1	University of CT-Storrs	Hartford	NP	Established	53	55	62
2	American International College	Hampden	NP	New-3years	6	0	1
3	Bay Path University	Hampden	PA	Established	28	29	23
4	University of MA-Amherst	Hampshire	NP	Established	58	36	27
5	MA College of Pharmacy and Health Sciences	Worcester, Boston	NP	Established	52	63	38
	MA College of Pharmacy and Health Sciences	Worcester, Boston	PA	Established	225	234	200
6	University of MA Medical School	Worcester	PA	Established	9	10	10
7	Elms College	Hampden	NP	New-4 years	30	25	25
8	Springfield College	Hampden	PA	Established	37	25	25
9	Westfield State University	Hampden	PA	New	0	0	0

<https://nces.ed.gov/ipeds/>

Charts 3: Supply of NPs and PAs 2015-2017



EMSI Workforce Occupation Snapshot Report

Findings:

Western Mass

- There were 53 new graduate NPs and 48 PAs in 2015
- There were 61 new graduate NPs and 54 PAs in 2016. This is an increase of 4 additional NPs and 6 PAs from the previous year.

- There were 94 new graduate NPs and 65 PAs in 2017. This is an increase of 33 NPs and 11 PAs from the previous year.

Five Counties

- There were 153 new graduate NPs and 258 PAs in 2015
- There were 179 new graduate NPs and 298 PAs in 2016. This is an increase of 26 additional NPs and 40 PAs from the previous year.
- There were 199 new graduate NPs and 299 PAs in 2017. This is an increase of 20 NPs and 1 PA from the previous year.

Table 6: 2017 Race and Ethnicity of Nurse Practitioner and Physician Assistants Graduates Five Counties

Category	Nurse Practitioners		Physician Assistants	
	Female	Male	Female	Male
White	117	7	101	36
Asian	6	0	11	4
Black/African American	9	6	1	1
Hispanic/Latino	9	3	4	3

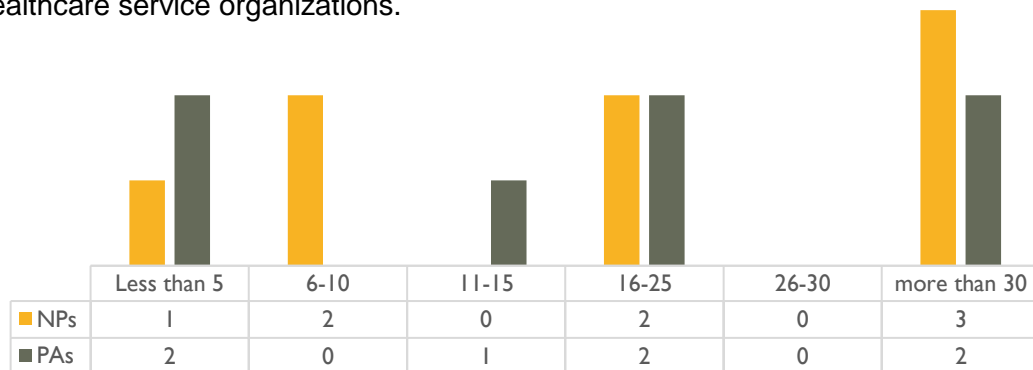
One of the goals of the WMNC is to increase the number of diverse nurses completing advance degree nursing programs. Over 71% of the population in western Massachusetts identify as White, Non-Hispanic, followed by 14.8% of the population identifying as Hispanic, 5.9% identifying as Black and the remaining comprised of other races. Over the next five years, the number of people identifying as Hispanic is projected to increase by 9%, adding nearly 10,000 residents. Additionally, the number of people identifying as Asian is projected to increase by 11%, adding nearly 2,500 residents in total. The larger urban areas such as Springfield and Holyoke possess very large Hispanic populations.

Survey Results from Healthcare Service Organizations in Western Mass

All of the healthcare service organizations that completed the survey answered all of the questions. Seven of the healthcare service organizations employ both nurse practitioners and physician assistants, one organization only employ nurse practitioners. The tables and charts in this section reflects the answers from all eight employers

Chart 4: NPs and PAs Staffing Levels in Organizations

The organizations were asked to select between 5 different options of staffing levels, ranging between *less than 5* to *more than 30*. Chart 4 shows the staffing levels of NPs and PAs at the 8 healthcare service organizations.

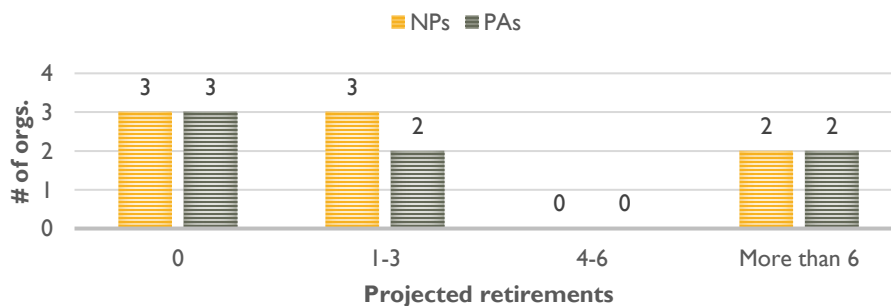


Findings:

- Thirteen percent (13%) of the respondents employ *less than five* NPs, while twenty five percent (25%) of respondents employ *less than five* PAs.
- Twenty five percent (25%) have a staffing level 6-10 NPs, while no respondent falls into this category for PAs.
- Thirteen percent (13%) of the respondents have a staffing level of 11-15 for PAs.
- Twenty five percent (25%) of respondents employ 16-25 NPs and PAs.
- None of the respondents have a staffing level of 26-30 for either NPs or PAs.
- Thirty-eight percent (38%) of the respondents employ more than 30 NPs, while twenty five percent (25%) of respondents employ more than 30 PAs.

Chart 5: Projected Retirements in the Next Five Years

The organizations were asked to estimate between zero, ranges within 1-6 and more than 6 projected retirements. Chart 5 shows the projected number of expected retirements over the next five years.

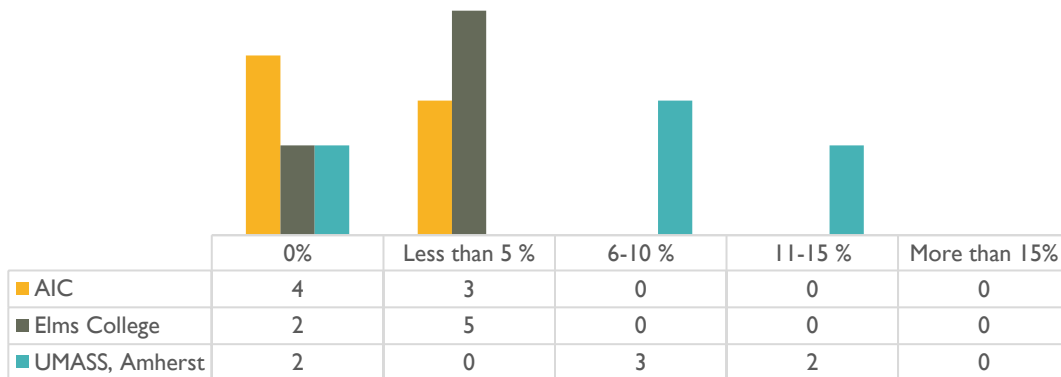


Findings:

- Three (3) organizations believe that they will see no retirements *over the five years*.
- Three (3) organizations believe that approximately 3 NPs will retire. Two (2) organizations believe that approximately 3 PAs will retire.
- Two organizations believe that they will see more than 6 retirements in the next five years.
- One of the organizations provided additional information, estimating that it expects to see eleven NPs and four PAs retire each year for the next five years.

Chart 6: Percentage of NPs Hired from American International College (AIC), Elms College and University of Massachusetts, Amherst (UMass, Amherst)

The organizations were asked to share approximately how many of their employees are graduates of the regional programs. They reported recruiting more of their NP workforce from schools such as: Boston College, Massachusetts College of Pharmacy and Health Science, Massachusetts General Hospital, Regis University, St. Joseph College, and UMASS, Worcester. Chart 6 shows the percentage of NPs who graduated from NP programs in western Massachusetts and are employed at one of the organizations.

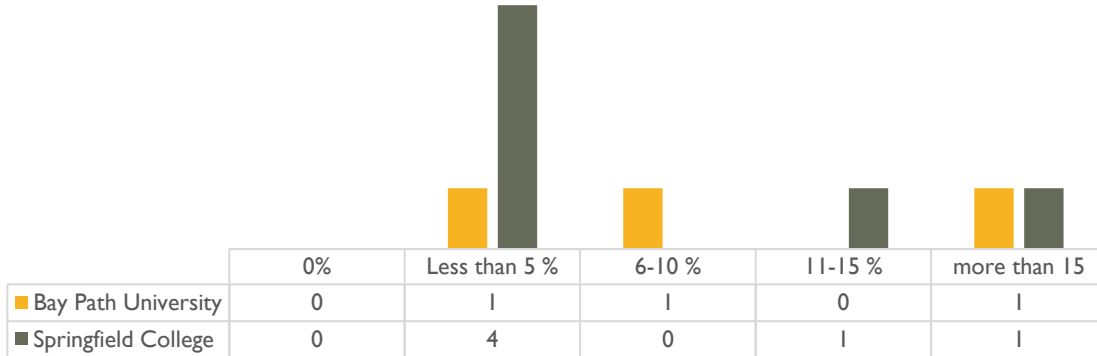


Findings:

- Fifty-four percent (54%) of the respondents reported that they have *no new graduates* from AIC.
- Twenty-nine percent (29%) of the respondents reported that they have *no new graduates* from Elms College and UMass, Amherst.
- Forty-three percent (43%) of respondent reported that *less than 5%* of their NP workforce graduated from AIC.
- Seventy-one percent (71%) of respondent reported that *less than 5%* NP of their workforce graduated from Elm College.
- Forty-three percent (43%) of respondents reported that *6-10%* of their NP workforce graduated from UMass, Amherst.
- Twenty-nine percent (29%) of the respondents reported that between *11-15%* of their NP workforce graduated from UMass, Amherst.

Chart 7: Percentage of PAs hired from Bay Path University and Springfield College

The organizations were asked to share approximately how many of their employees are graduates of the regional programs: Bay Path University and Springfield College.

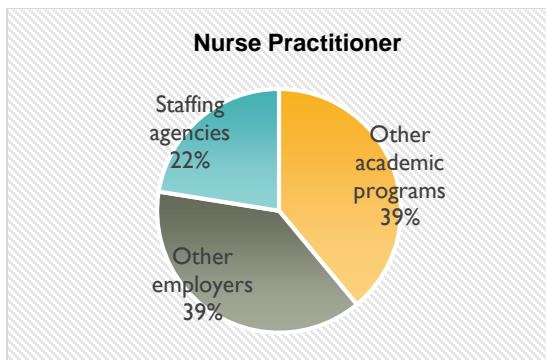


Findings:

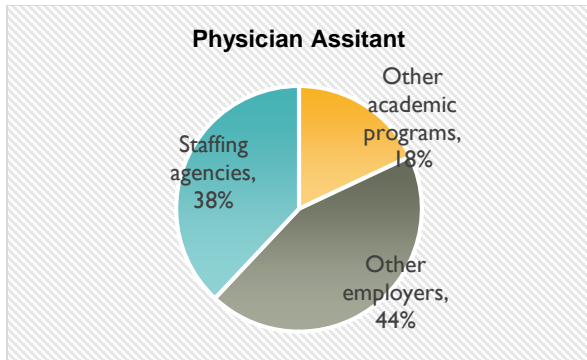
- All of the seven (7) respondents reported recruiting PAs from both schools.
- Twenty percent (20%) of respondents reported that *less than 5%* of their PA workforce graduated from Bay Path University.
- Sixty-seven percent (67%) of respondents reported that *less than 5%* PA of their workforce graduated from Springfield College.
- Twenty percent (20%) of respondents reported that *6-10%* of their PA workforce graduated from Bay Path University.
- Twenty percent (20%) percent of the respondents reported that between *11-15%* of their PA workforce graduated from Springfield College.
- Twenty percent (20%) percent of the respondents reported that *more than 15%* of their PA workforce graduated from Bay Path University and another twenty percent (20%) reported that *more than 15%* of their PA workforce graduated from Springfield College.

Charts 8 and 9: Other Nurse Practitioner and Physical Assistant Supply Sources

They were asked to select the percentage of their current staff who were from other academic programs outside of the region, other organizations (not location specified) as well as the percentage of employees who were recruited from staffing agencies. Charts 7 and 8 shows the percentage breakdown on other sources where organization recent employees.



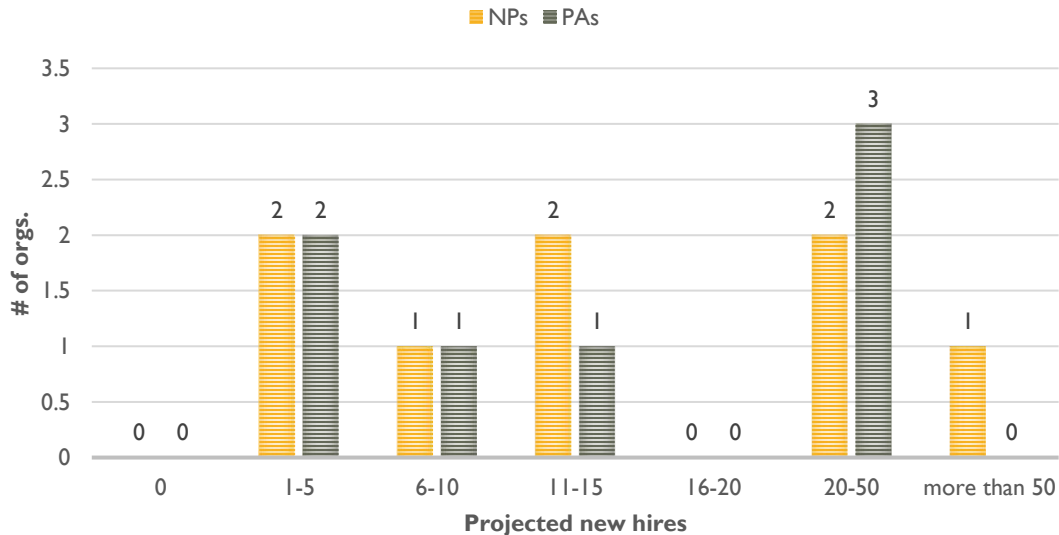
Thirty nine percent (39%) of nurse practitioners are recruited from other employers, another thirty-nine percent (39%) are recruited from other academic institutions and twenty-two percent (22%) are recruited from staffing agencies.



Forty-four percent (44%) of PAs are recruited form other employers, thirty-eight percent (38%) from staffing agencies and eighteen percent (18%) from other academic institutions.

Chart 10: Projected New Hires for NPs and PAs in the Next Five Years

The organizations were asked to select between several ranges of approximate additional new hires for NPs and PAs. These numbers only new reflect practitioners as a result in increased demand. Chart 10 shows the estimated number of additional hires within the 8 organizations over the next five years.



Findings:

- All of the organizations expect to hire new practitioners.
- Two respondents believe that they will hire approximately 1-5 new NPs and PAs. One organization believe that it will hire 6-10 new NPs and PAs.
- Two organizations believe that they will hire approximately 11-15 new NPs. One organization believe that it will hire 11-15 new PAs.
- No organization believe that it will hire between the range of 16-20 of either NPs or PAs; but two organizations believe that they will hire approximately 20-50 NPs.
- One organization believe that it will hire 20-50 new PAs, and one organization believe that it will hire *more than 50* new NPs in the next five years.

Chart 11: Retention Rates for Newly Hired NPs (2 Years)

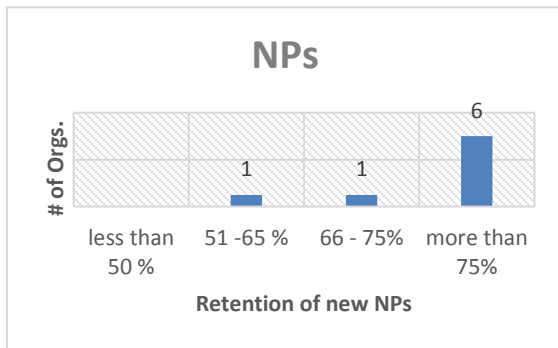


Chart 11 shows retention rates for newly hired NPs. Six (6) organizations responded that *more than 75%* of their newly hired NPs are still hired after 2 years, one (1) organization responded that *66-75%* are still hired. One organization responded that *51-65%* are still hired after two years.

Chart 12: Retention Rates for Newly Hired PAs (2 Years)

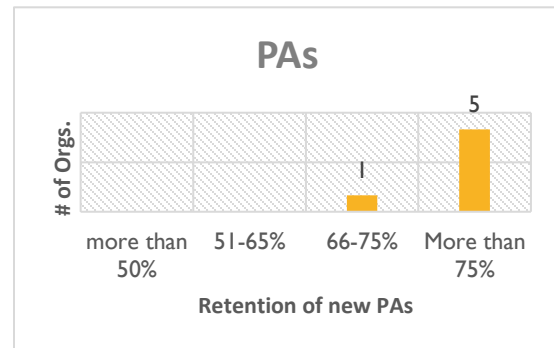
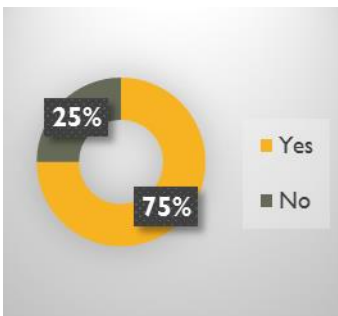


Chart 12 shows retention rates for newly hired PAs. *Five (5)* organizations responded that *more than 75%* of their newly hired PAs are still hired. One organization responded that *66-75%* are still hired after 2 years.

Chart 13: Employer Assessment of New NP Graduates' Skills

One of the objectives of the group is to create, expand and educate employers on *On-the-Job Training* opportunities for new graduates. This strategy was identified to address the organizations' concerns that very few NP job applicants have 10 or more years of experiences. The group wanted to determine if new graduates have the necessary skills to practice or are more intensive orientation programs necessary to prepare new practitioners.

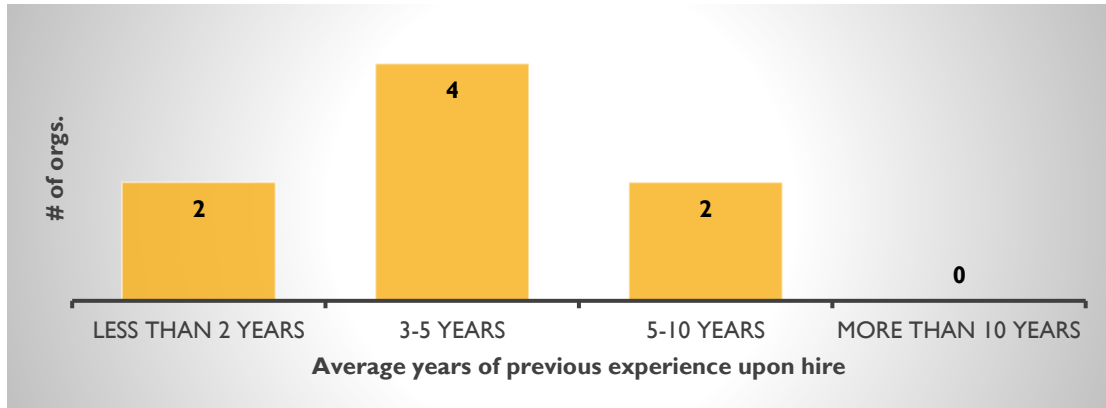


Seventy-five (75%) of the respondents responded that new NP graduates possess the necessary skills when they are hired, twenty 25% of respondents do not believe NP graduates have the necessary skills upon hire. Additional feedback from respondents on this question are:

- Some don't have a lot of behavioral health experience, which we developed a training program to address.
- All are board certified and licensed. New graduates usually have appropriate experience as a RN.
- This really is dependent on the applicant, sometimes yes and sometimes no.
- We would like to see more specialized training in acute care specialties.
- More clinical hours, critical thinking, time management, mentorship.
- We are a specialty Orthopedic Hospital and many do not have that skill.

Chart 14: Average Years of Practice Experience for Newly Hired NPs

Chart 14 displays the average years of previous work experience for nurse practitioners at the time of hire.

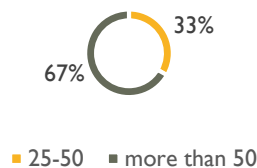


Findings:

- Two employers responded that the NPs they hire have less than 2 years of previous work experience.
- Four employers responded that their new NPs have less than 3-5 years of previous work experience.
- Two employers responded that their new NPs have less than 5-10 years of previous work experience.

Survey Results from NP Programs in Western Mass

Charts 15: Western Mass Residents in Western Mass NP Programs



Findings:

- One of the schools reported that 25-50% of their students are Western Mass residents.
- Two schools reported that more than 50% of their students are Western Mass residents.

Chart 16: Academic Program Enrollment Constraints



Findings:

- The academic programs were asked about their constraints for enrolling students in to NPs programs. They were asked to select between the following options (faculty capacity, clinical placements, student interest, infrastructure, and no constraints). There all responded that their only constraint is limited clinical placement opportunities.

APPENDIX A

Top Companies Posting: Occupation search: "Nurse Practitioners" - with no minimum education level specified returned different results than when specified for Master's Degree and higher

Nurse Practitioners

Company	Total Postings (Aug 2017 - Jul 2018)	Unique Postings (Aug 2017 - Jul 2018)	Median Posting Duration
Baystate Medical Center, Inc.	229	42	65 days
Bay State Hospital	64	22	85 days
Barton & Associates, Inc.	150	20	32 days
Northeast Healthcare Recruitment, Inc.	201	17	47 days
Matrix	38	15	35 days
Nehc LLC	190	11	10 days
Trinity Health Corporation	25	8	5 days
Team Health Holdings, Inc.	61	7	133 days
Justice	23	7	26 days
Mercy Medical Center, Inc.	16	7	39 days
National Coalition of Healthcare Recruiters	19	7	6 days
Maxim Staffing Solutions	8	6	77 days
Risk Adjustment Management LLC	47	6	14 days
National Recruiters, LLC	14	6	5 days
CVS Health Corporation	53	6	116 days
Minuteclinic, L.L.C.	16	5	63 days
Cooley Dickinson Health Care Corporation	37	5	57 days
Maxim Physician Resources, LLC	5	5	15 days
Next Medical Staffing LLC	11	5	79 days
Valley Medical Group, P.C.	8	5	34 days
United States Department of the Air Force	10	5	9 days
Riverbend Medical Group	6	4	60 days
Med Centrix Inc	5	4	26 days
Talentcare	24	4	43 days
Commonwealth Care Alliance, Inc.	16	4	70 days
Department of Veterans Affairs	14	4	22 days
Unitedhealth Group Incorporated	59	4	76 days
Maxim Healthcare Services, Inc.	5	4	146 days
University of Massachusetts	21	3	n/a
Ehana LLC	26	3	69 days
New England Urgent Care	18	3	46 days
Medoptions Inc	3	3	12 days
Primary Care	7	3	5 days
Genesis Healthcare, Inc.	4	3	35 days
Medexpress	13	3	41 days
Berkshire Medical Center, Inc.	10	3	38 days
Landmark Health, LLC	20	2	67 days
The Csi Companies Inc	10	2	50 days
Jean M Bruch	8	2	31 days
The First Church of Christ Scientist In Boston Massachusetts	14	2	59 days
Shriners Hospitals For Children	9	2	22 days
Columbia Healthcare	19	2	38 days
St Joseph Mercy Hospital	4	2	224 days
Patriotic Hearts Inc	11	2	10 days
March Healthcare Agents Inc	4	2	22 days
Holyoke Medical Center, Inc.	2	2	1 day
Health Career Services	2	2	n/a
Locumtenens.com, LLC	4	2	4 days
Holyoke Chicopee Area Health Center Inc	5	2	n/a
Independent Medical Evaluation Center	7	2	3 days

APPENDIX B**Top Cities Posting****Nurse Practitioner**

City	Total Postings (Aug 2017 - Jul 2018)	Unique Postings (Aug 2017 - Jul 2018)	Median Posting Duration
Springfield, MA	1,037	190	47 days
Holyoke, MA	194	35	44 days
Amherst, MA	154	34	35 days
Northampton, MA	167	30	42 days
West Springfield, MA	82	21	31 days
Palmer, MA	106	19	18 days
Westfield, MA	41	17	36 days
Greenfield, MA	91	16	65 days
Deerfield, MA	112	15	40 days
Chicopee, MA	101	14	54 days
Agawam, MA	25	11	19 days
Hadley, MA	16	5	79 days
Ludlow, MA	33	3	20 days
Southampton, MA	10	3	31 days
Wilbraham, MA	4	2	3 days
Bondsville, MA	1	1	38 days
Hampden, MA	3	1	41 days
Leeds, MA	2	1	16 days
Longmeadow, MA	1	1	24 days
South Hadley, MA	1	1	8 days
Ware, MA	1	1	10 days

APPENDIX C**Top Posted Job Titles****Nurse Practitioner**

Job Title	Total Postings (Aug 2017 - Jul 2018)	Unique Postings (Aug 2017 - Jul 2018)	Median Posting Duration
Nurse Practitioners	1,978	373	43 days
Registered Nurses	10	5	35 days
Family Practice Physicians	12	5	21 days
Physicians	20	5	74 days
Employee Health Nurses	20	4	21 days
Medical Center Managers	35	3	65 days
Dental Hygienists	4	3	6 days
Program Managers (Management)	3	2	85 days
Directors of Rehabilitation	9	2	52 days
Physical Therapists	15	2	95 days
Advance Practice Registered Nurses (APRN)	2	2	31 days
Licensed Practical Nurses (LPN)	27	2	46 days
Assembly Leads	2	2	4 days
Directors of Emergency Services	3	1	155 days
Residence Directors	3	1	11 days
Assistant Directors (Management)	1	1	24 days
Clinical Educators (Healthcare Practitioners and Technical)	1	1	3 days
Clinical Partners	7	1	82 days
Community Health Nurses	2	1	39 days
Nursing Staff Development Coordinators	9	1	185 days
Emergency Medical Technicians (EMT)	2	1	159 days
Physician Assistants (PA)	10	1	56 days
Admissions Nurses	5	1	46 days
Data Entry Clerks	2	1	29 days

APPENDIX D**Top Companies Posting:** Occupation search, "Physician Assistant" with no minimum education level specified**Physician Assistants**

Company	Total Postings (Aug 2017 - Jul 2018)	Unique Postings (Aug 2017 - Jul 2018)	Median Posting Duration
Baystate Medical Center, Inc.	147	23	70 days
Trinity Health Corporation	61	19	100 days
NP Now	74	19	34 days
Medexpress	121	17	72 days
Unitedhealth Group Incorporated	42	10	38 days
Barton & Associates, Inc.	35	8	35 days
Department of Veterans Affairs	35	8	123 days
Riverbend Medical Group	42	7	62 days
St Joseph Mercy Hospital	26	7	43 days
National Coalition of Healthcare Recruiters	14	5	49 days
Landmark Health, LLC	9	4	3 days
Bay State Hospital	20	4	n/a
Cooley Dickinson Health Care Corporation	7	4	31 days
Talentcare	14	4	55 days
Commonwealth Care Alliance, Inc.	26	4	32 days
Valley Medical Group, P.C.	9	4	13 days
Mercy Medical Center, Inc.	16	4	24 days
Mercy Health	16	3	108 days
Northampton Co Inc	6	3	92 days
Massachusetts Long Term Care Mutual Aid Association Inc	8	3	35 days
Eap Network Inc	9	3	10 days
Columbia Healthcare	3	3	n/a
Bariatrics	7	3	8 days
Genesis Healthcare, Inc.	6	3	34 days
Total Healthcare Recruiting LLC	4	3	2 days
Sisters of Providence, Inc.	11	3	259 days
Favorite Healthcare Staffing, Inc.	2	2	24 days
Medestar	4	2	64 days
Palm Health Resources	3	2	n/a
Physician Assistant Academy of Vermont	4	2	91 days
Healthcare Systems, Inc.	11	2	68 days
Patriotic Hearts Inc	12	2	14 days
Primary Care	7	2	22 days
Lee Staffing Inc	2	2	6 days
Clinical Management Consultants	6	2	n/a
Health Career Services	2	2	n/a
Mercy Behavioral Health	4	2	n/a
Independent Medical Evaluation Center	13	2	n/a
Hampshire Gastroenterology	3	2	7 days
United States Department of the Air Force	3	2	3 days
NP PA Recruiters, Inc.	3	1	115 days
Physician Assistant Solutions LLC	12	1	46 days
Allstar Recruiting	1	1	n/a
Urgent Care Center	17	1	6 days
Amn Healthcare Services, Inc.	5	1	11 days
National Health Partners, Inc.	1	1	97 days
New England Dermatology A	1	1	n/a
American Academy of Physician Assistants, Inc.	24	1	158 days
University of Massachusetts	8	1	62 days
Echo Locum Tenens, Inc.	4	1	n/a

APPENDIX E**Top Cities Posting****Physician Assistant**

City	Total Postings (Aug 2017 - Jul 2018)	Unique Postings (Aug 2017 - Jul 2018)	Median Posting Duration
Springfield, MA	854	182	46 days
Holyoke, MA	79	22	44 days
Chicopee, MA	74	17	87 days
Northampton, MA	36	15	37 days
Greenfield, MA	54	12	76 days
Westfield, MA	41	9	52 days
Agawam, MA	11	8	19 days
Amherst, MA	10	6	13 days
Hadley, MA	10	4	10 days
Ludlow, MA	20	4	33 days
West Springfield, MA	7	4	15 days
Bondsville, MA	3	3	n/a
Monson, MA	14	3	n/a
Palmer, MA	17	3	n/a
Leeds, MA	10	2	68 days
Easthampton, MA	2	1	n/a
Florence, MA	1	1	31 days
Ware, MA	1	1	4 days

APPENDIX F**Top Posted Job Titles****Physician Assistants**

Job Title	Total Postings (Aug 2017 - Jul 2018)	Unique Postings (Aug 2017 - Jul 2018)	Median Posting Duration
Physician Assistants (PA)	1,244	297	46 days

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For more information contact: Peta-Gaye Porter

Manager of Healthcare Workforce Initiatives, pporter@masshirecwb.com



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