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## A New Career Map Methodology Using Data from Online Work Histories



### Introduction

Workforce development and educational practitioners and policy makers want to know how to help people choose a field of work and advance in their careers. Increasingly, postsecondary institutions are being held accountable for their graduates' short- and long-term employment outcomes. As a result, career mapping and career pathway efforts have become essential concepts and initiatives.<sup>1</sup> While some career mapping tools are informed by industry intelligence, many are based on long-held assumptions or the aspirations of the people who develop them, so the career trajectories they portray may not be those experienced in the workforce.

The New York City Labor Market Information Service (NYCLMIS) and its colleagues at Kingsborough Community College and the City University of New York (CUNY) Office of Continuing Education and Workforce Development wanted to understand the way careers develop in the real world with the belief

<sup>1</sup> See, for example, Center for Law and Social Policy, [Funding Career Pathways: a Federal Funding Toolkit for State and Local/Regional Career Pathway Partnerships](#), Revised Edition, February 2015; [Bridge the Gap: Rebuilding America's Middle Skills](#), Accenture, Burning Glass Technologies, and Harvard Business School, November 2014; [Pennsylvania Adult Education Resources](#); Portland Community College, [Career Pathway Road Maps](#); and MPR Associates, [ABE Career Connections: A Manual for Integrating Adult Basic Education into Career Pathways](#), Washington, DC: US Department of Education Office of Vocational and Adult Education, 2011.

that this information could be used to improve the effectiveness of programs and services at CUNY.

The partners decided to create career maps for three starting occupations: medical assistant, home health aide, and cook. Since their release, the career maps have been used by hundreds of students and CUNY staff who work with them. They have received a positive reception from higher education and workforce development professionals nationwide. NYCLMIS prepared this report to:

- Address frequently asked questions about the maps;
- Report findings of the career mapping analysis that have not been published previously;<sup>2</sup> and
- Help labor market analysts in the public- and private sectors replicate this approach in other locations with other occupations.

### Data Sources and Methods

The first task at hand was to find the right data source. The NYCLMIS sought a source that could capture information from the millions of resumes posted online. After exploring alternatives, the NYCLMIS and its partners at Monster Government Solutions

<sup>2</sup> All [career maps](#) and [career map companion pieces](#) can be found on NYCLMIS' website.

identified survey data owned by PayScale.com.<sup>3,4</sup> People who use PayScale’s website report their own education and work histories use information from the site to benchmark their salaries or inform salary negotiations. Firms use information from PayScale to determine their own compensation levels. Over time, PayScale has accumulated millions of self-reported work histories.

The NYCLMIS, PayScale, and Monster Government Solutions devised the method explained below to demonstrate five- and ten-year career paths. The data fields used to create the career maps included current job title,

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number of years in the field, current job location, and job title five years ago. PayScale also provided data on the most common certifications, educational attainment, and common college majors (for those with degrees); and median annual wage and years of experience in the field.

**Sample selection.** The NYCLMIS hoped to select its sample from PayScale users working in New York City so the career maps would be as relevant as possible to CUNY students who come from the local workforce. To attain a sufficient sample size to conduct the planned

<sup>3</sup> This document is not intended to endorse any specific vendor or product. Monster Government Solutions and PayScale.com are mentioned here because they partnered with the NYCLMIS to develop this approach.

<sup>4</sup> A great deal of the career maps’ value to end users came from other sources; however, this paper focuses on the data, methods, and results of analyses of the data from online work histories used to create the career maps.

analysis, however, PayScale needed to broaden the geographic scope to New York State for the medical assistant career map, and the New York City Metropolitan Statistical Area for the cook and home health aide career maps.

**Five-year analysis.** To be included in the five-year analysis, PayScale users had to meet three criteria. They had to:

- Say that their job title five years earlier was one of the relevant starting occupations — i.e., medical assistant, cook, or home health aide, respectively;
- Have less than five years of experience at the time they held the starting job title; and
- Have between five and 10 years of experience in the same field when they submitted their online work history.

Together, these criteria ensured that the individuals in the five-year sample were in the starting occupation at or near the beginning of their careers in the relevant field and that they had remained in the field for at least five years. PayScale reported the most common job titles they held at the time they entered their online work histories along with summary statistics on education, experience, and wages.

**Ten-year analysis.** To be included in the 10-year analysis, PayScale repeated the process described above, this time selecting individuals who were more experienced in their relevant fields. To be included in the 10-year sample, people had to:

- Hold one of the positions identified in the five-year analysis five years earlier;
- Have five to 10 years of experience at the time they held that title; and
- Have 10 to 15 years of experience in the field when they entered their online work history.

Again, PayScale provided the titles most commonly held by these people when they

entered their online histories.<sup>5</sup> The results of these analyses are outlined below.

## Results

**Medical Assistant.** In the five-year analysis (n=1,925), 55 percent of the people who were medical assistants five years earlier were still in the same title. Of the remaining people, the most common healthcare occupations — licensed practical nurse (LPN), phlebotomist, receptionist, medical office biller, research coordinator — can be categorized into four career tracks: clinical, technical,

administrative, and research (Table 1).

The most common levels of educational attainment the five-year sample were either a high school diploma or “some college” (no degree). Among the medical assistants, the most common certifications included Certified Medical Assistant (CMA), ASCP Phlebotomist, and Cardiopulmonary Resuscitation (CPR). For the other titles, the most common certifications were LPN and Basic Life Support for the LPNs, and Medical Billing and Coding and Certified Coding Professional for the medical office billers.

The 10-year results suggest that a majority

**Table 1. Five and Ten-Year Results of the Medical Assistant Career Progression Analysis**

TRACK	5 YEAR PROGRESSION	%	10-YEAR PROGRESSION	%
None	Medical Assistant	55%		
Clinical	Licensed Practical Nurse†	8%	Licensed Practical Nurse	61%
			Registered Nurse	21%
			MDS Coordinator	2%
			Charge Nurse LPN	4%
Technical	Phlebotomist†	5%	Phlebotomist	59%
			Lab Assistant	3%
			Lab Technician	2%
Administrative	Medical Receptionist	4%	Receptionist	28%
			Office Manager	12%
			Medical Secretary	7%
	Medical Office Biller	3%	Dental Assistant	5%
			Medical Office Biller	3%
Research	Clinical Research Coordinator	3%	Clinical Research Coordinator	32%
			Clinical Research Associate	8%
			Lead Research Coordinator	5%

† The results included three exceptions to the career track pattern that are not shown in this table. At the 10-year progression, three percent of phlebotomists were licensed practical nurses and five percent of clinical research coordinators were registered nurses.

<sup>5</sup> PayScale.com did not provide occupations when the sample included fewer than 20 cases.

people remain on the same career track. Phlebotomists become lab technicians, and medical receptionists become office managers. There were exceptions: a small percentage of the people who were in clinical titles at 10 years were in technical and research titles five years earlier. For the 10-year analysis, additional common certifications included Resident

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Assessment Coordinator-Certified (RAC-CT) and Certified MDS Coordinator (CMDSC) for the MDS coordinators, Advanced Cardiac Life Support (ACLS) for the RNs, and Certified Dental Assistant for dental assistants.

**Home health aide.** Almost half (47%) of the 353 people in the five-year sample were still home health aides. Of the remaining people, the most common titles were medical assistant (17%), RN (9%), and ultrasound technician (5%).

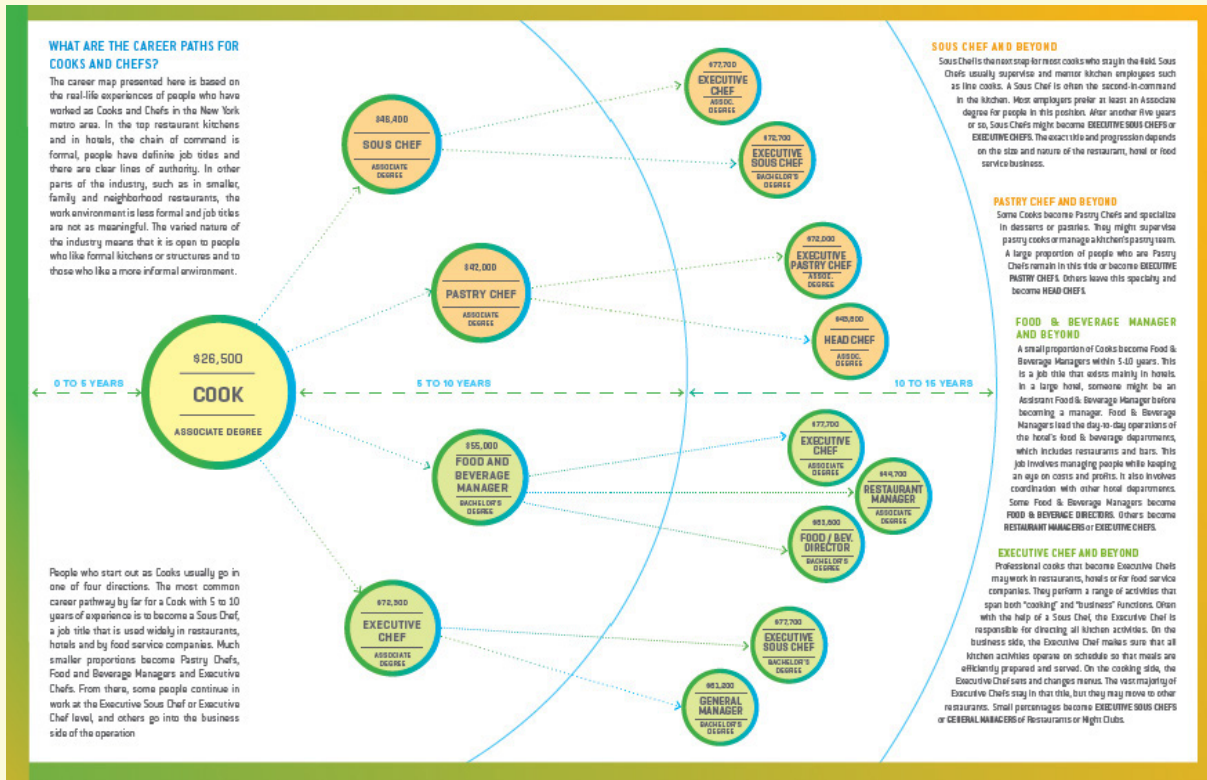
In the 10-year analysis (n=915), for each of the occupations held five years earlier, the largest percentage still held that same title. For example, 48 percent of the people who reported that they were medical assistants five years earlier remained in the same title. Of the rest, the most common occupations were LPN (7%) and RN (10%). Forty-four percent of the people who reported that they were RNs five years earlier were still RNs. The next most common titles were nurse practitioner (11%) and nurse supervisor (4%). More than three quarters (78%) of those who had been ultrasound technologists five years prior remained in the same title in the 10-year analysis. Eleven percent were ultrasound supervisors and six percent became laboratory managers.

At baseline, the most common educational attainment was a High School Diploma, and the most popular certifications were Certified Home Health Aide (CHHA) and CPR. For people in the field with five to 10 years of experience, additional common certifications included CMA for medical assistants, and Registered Diagnostic Medical Sonographer (RDMS), and American Registry of Diagnostic Medical Sonographers (ARDMS)- OB/GYN, for ultrasound technologists. In addition to those mentioned above, the most popular certifications for people with 10 to 15 years of experience in the field were American Nurse Credentialing Center (ANCC), Advanced Life Support, and Advanced Cardiac Life Support for RNs; and Registered Vascular Technologist (RVT) and Registered Diagnostic Medical Sonographer (RDMS) certifications for laboratory managers.

The data also revealed the most common degree programs for people who completed two- or four-year degrees. In the five-year analysis, the most popular degree programs were Nursing for RNs, Practical Nursing for LPNs, Diagnostic Sonography/Ultrasound for ultrasound technicians, and Medical Assisting for medical assistants. After the Associate Degree in Medical Assisting, the Associate Degree in nursing was the most commonly held degree among medical assistants. Among those in the field with 10 to 15 years of experience, in addition to those mentioned above, the most popular programs included Family Nursing for nurse practitioners, and Radiology and Microbiology for ultrasound supervisors and laboratory managers.

**Cooks.** With the help of industry experts and representatives, the NYCLMIS detected three somewhat overlapping career tracks: culinary, business and management, and “hybrid” culinary-business careers (Figure 1). Of the 206 cases included in the five-year analysis, 31 percent were still cooks, 41 percent advanced to become sous chefs, 10 percent were pastry chefs, seven

Figure 1. Cook Career Map



percent were food and beverage managers, and six percent were executive chefs.

There were 466 cases in the 10-year sample. The results suggest that, while some people remained in strictly culinary occupations, the general tendency was to move into business or hybridized titles. For example, 24 percent of the sous chefs remained in the same title; the remainder were in hybrid titles such as executive chef (20%) or executive sous chef (17%). Forty-three percent of the pastry chefs remained in the same title, 13 percent became head chefs, and 12 percent became executive pastry chefs.

Also in the 10-year analysis, the most common titles for people who were food and beverage managers were restaurant managers (15%), executive chefs (13%), and food and beverage directors (13%). For the most part, executive chefs at 10 years were also executive

chefs five years prior (73%). A small number had become executive sous chefs (3%) or restaurant general managers (3%).

At baseline, the most popular certifications were ServSafe Food Handler and Food Protection Professional. The most common educational attainment was an Associate Degree, and the most common degree programs were Culinary Arts and Hospitality Management. In addition to the certifications held by cooks with less than five years' experience, the most popular certification was Training for Intervention Procedures (TIPS) alcohol certification for food and beverage managers. The same degree programs were seen in the sample of people with five to 10 years of experience, with the addition of Food Service and Culinary Management and Tourism and Travel programs. No new certifications were seen in the 10-year sample; however, the most



popular degree programs also included Business Administration and Hotel Management.

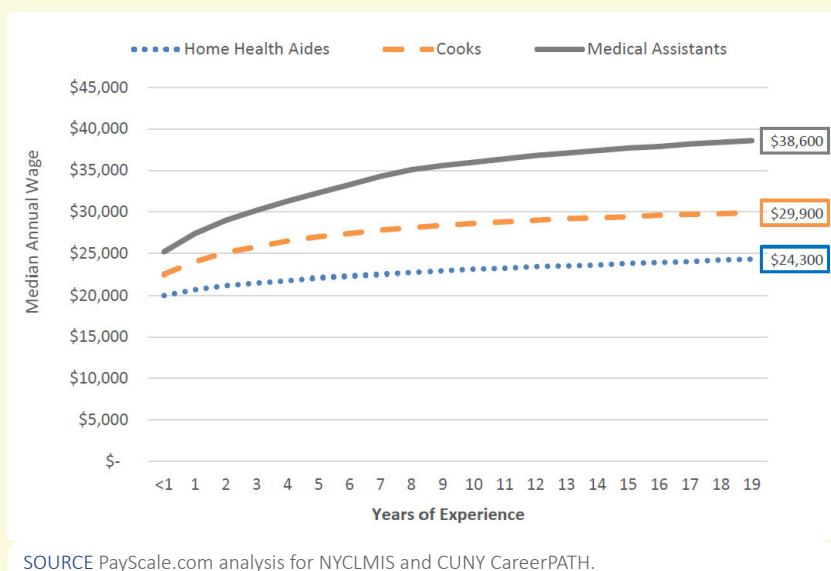
**Pay and experience.** PayScale analyzed the median wages for the three starting occupations by years of experience (Figure 2). The graph shows that while the starting salaries are within \$5,000 of one another, there is more wage growth for medical assistants as they gain experience than there is for home health aides or cooks. For medical assistants, 10 years of experience is associated with about \$10,000 more in wages; the same level of experience is associated with \$3,000 and \$6,000 more for home health aides and cooks, respectively. Regardless, medical assistants with 19 years of experience are earning slightly less than is considered a living wage for a family of two adults and two children in New York City, while individuals in cook or home health aide titles top out well below that.<sup>6</sup> Because the figures shown below are medians, 50 percent of the people in the sample earned even less than the figures shown below.

## Discussion and Implications

Overall, the results validated some commonly held assumptions and challenged others. For example, anecdotal evidence suggested that people do not remain in culinary occupations for a long time because of the physical demands of the field. The results suggest that some people do in fact remain in strictly culinary titles, though a substantial percentage move into business or hybridized business-culinary titles. On the other hand, home health aides did not advance into nursing assistant titles as anecdotal evidence had indicated. This may be because of the weak labor market demand for nursing assistants during the five-year period before the career maps were made. Other key takeaways are listed below.

**Many people remain in the same lower-paid jobs for a long time.** While educators and workforce program staff may be aware of this intuitively, the data revealed a stark reality. For example, the data showed that 47 percent of home health aides and 55 percent of medical assistants

**Figure 2. Medical Assistants, Home Health Aides, and Cooks: Median Annual Wage by Years of Experience**



6 [MIT Living Wage Calculator](#) (consulted September 23, 2015)

were in the same job titles five to 10 years into their healthcare careers. It further showed that experience in the same title was associated with some wage gain, but, for at least half, not enough to support a family with children in New York City.

Educators and workforce development providers should help people who, for a variety of reasons, remain in these lower paid jobs to stabilize their finances and navigate their careers so that they can eventually get ahead. The data suggest that many people in lower paid jobs would benefit from help with career planning and education financing to help them advance into higher-paid work.

Whether low-paid individuals are planning to undertake further education and advancement or not, workforce and educational professionals who are in contact with them should encourage them to take advantage of publicly-available benefits — such as Supplemental Nutrition Assistance Program (SNAP), subsidized child care, and Earned Income Tax Credits (EITC) — that can help to stabilize their household resources while they acquire education and experience.<sup>7</sup> Low-paid workers also should be advised about other employers that may offer better pay, benefits, flexible scheduling, or professional development, and about employers that are party to collective bargaining agreements.

<sup>7</sup> For evidence of the role of benefits in alleviating poverty in New York City, see Gianarelli, L., L. Wheaton, and J. Morton, [How much could policy changes reduce poverty in New York City?](#), Urban Institute, Washington, DC, 2015; Levitan, M., [Policy affects poverty: the CEO poverty measure: 2005-2009](#), Center for Economic Opportunity Working Paper, March 2011; and Levitan, M. and D. Scheer, [Estimating the impact of food stamps on the New York City poverty rate using a National Academy of Sciences-style poverty measure](#), Institute for Research on Poverty Research Paper No. 1398-12, Madison, WI, November, 2011.

**Actual career paths do not always move forward or involve higher pay.** For some people, better pay is not the primary reason for moving to another title. For example, some medical assistants in this sample became medical receptionists or medical office billers, jobs that generally pay less. There are a variety of reasons this might occur. For example, they may not have succeeded as medical assistants, or they might have preferred the administrative, rather than the clinical side of the job. Another example was found in the cook career path. Some chefs appear

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to accept lower pay in order to move into the business side of the operation. In both cases, the data suggest that people sometimes accept reduced pay and that they do so for a variety of reasons.

**People work in entry-level titles in their fields while they study to attain higher-level credentials.** As we saw, many individuals who were RNs reported that they had been working as home health aides five years earlier. Discussions with educators and industry experts revealed that this is a common strategy for nursing students to earn income while in school. While this work may provide useful exposure to clinical care, and may offer the type of flexibility students need, the pay is often quite low. Colleges should consider helping students identify and attain additional skills and credentials — care coordination, electronic medical records or hemodialysis, for example — that might help them earn more while they learn.

## Replication Advice

**Do not skip industry validation.** Using online work histories gave the partners access to information about career paths that people actually followed. As valuable as these data were, it was still important to consult with industry experts in the process. NYCLMIS contacted professional organizations, industry experts, and employers to help interpret the data. For example,

**The right graphic design is essential to conveying the multiple dimensions of career progression.**

in the cook career map, the main distinction in career tracks appeared to be between the hands-on cooking side and the management or business side. Industry experts made clear that a number of jobs were hybrids. This information was included in the career map. It was also industry experts who explained that nursing students commonly took on home health aide work for income while they were still in school and that the results obtained made sense.

Industry experts also provided information on how jobs or responsibilities might change even when a job title does not. In some industries, people change jobs within the same occupation, sometimes to work for a more desirable employer or for better pay. The maps are far more accurate and useful than they would have been without expert feedback and assistance interpreting titles, salaries, educational information and career tracks. The importance of consulting with industry experts cannot be overemphasized.

**Be aware of the data limitations.** Although PayScale provided a rich source of information, the results were suggestive, not definitive. It is likely that people who have less access to technology or are less informed about ways to benchmark their own salaries are less likely to use PayScale, and are therefore underrepresented. While the clues provided by industry experts were helpful, there is no way to know with any precision how much and in what ways that selection bias affected the results reported here.

**Choose the field wisely.** PayScale data are more straightforward in some industries than others. For example, career tracks in healthcare are easier to identify because job titles are fairly standard across the industry. Other less structured fields can prove more difficult to chart, as people report different job titles in different parts of the industry and titles may be too numerous or difficult to compare.

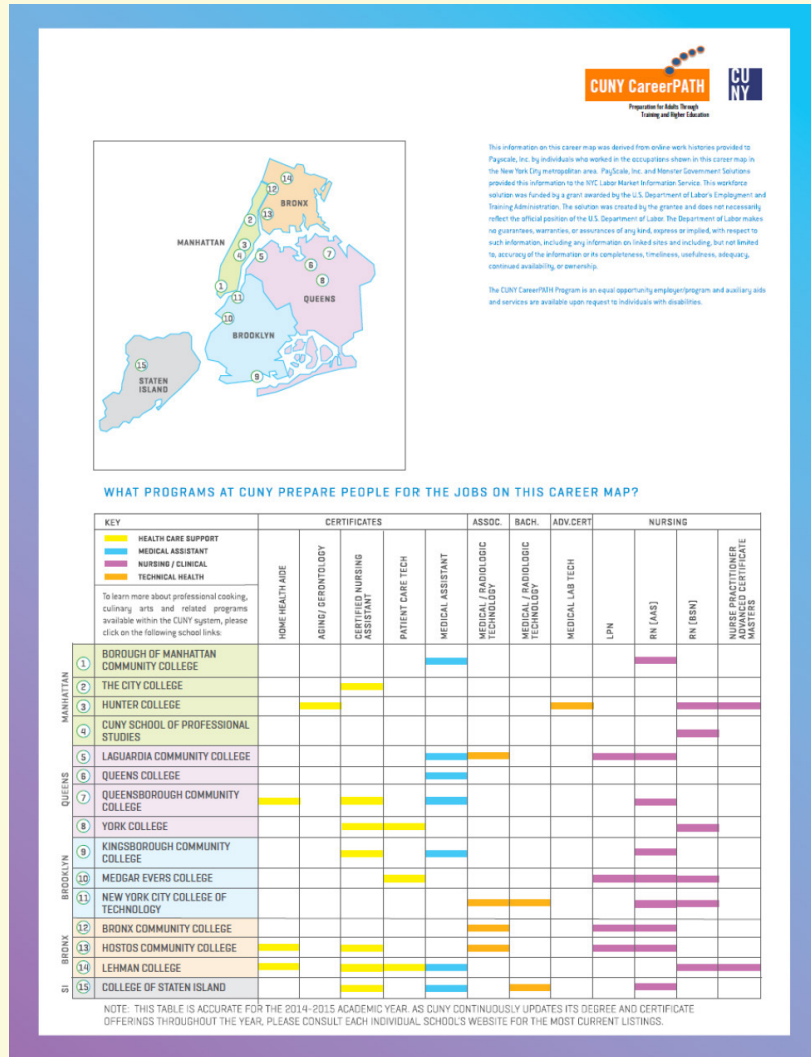
**Select common occupations.** If the number of online work histories is too small, the geographic area might have to be broadened so much as to reduce the relevance of the career map to the local workforce. In the cases undertaken by the NYCLMIS, the occupations selected had large numbers of people working in them. Even so, the geographic area from which the sample was selected had to be expanded to the Metropolitan Statistical Area for two occupations and to New York State for the third.

**The right graphic design is essential to conveying the multiple dimensions of career paths.** Effective career maps are not just about the data. Graphic design affects their usefulness to students. The NYCLMIS used a competitive process to select a graphic designer with demonstrated expertise in generating infographics. The career maps' design is clean, simple, and colorful, and reflects the multiple dimensions of the data through the use of color coding, lines and shapes, and icons related to required and preferred credentials (Figure 1). The reverse side of the maps contains a table explaining the educational offerings at CUNY that are related to jobs on the career map. The color-coding of the education offerings matches the job families on the career map (Figure 3).

**The past does not necessarily predict the future.** Even though the information provided by PayScale is drawn from the most recent year, events happening now may have an impact on career advancement opportunities in the selected field. For example, healthcare is undergoing a great deal of change, which will affect roles, responsibilities, and available career paths. At present, some healthcare employers in New York City only hire RNs with Bachelor's degrees in nursing. If this trend continues, the length of time needed to move to an RN position from an entry-level



**Figure 3. Educational Programs at CUNY Related to Home Health Aide Career Paths**



job title will increase or people with Associate degrees in nursing may be found working in other titles. In the home health aide map, an Associate degree in nursing was the second most popular education credential for medical assistants with five to 10 years' experience. It is possible that these individuals chose medical assisting over nursing, but it also might suggest that they were unable to secure work in the RN title.

State legislation authorizing the creation of a new advanced home health aide title is expected to be introduced in the coming months. Even before the passage of such legislation, new titles with more responsibilities and higher pay are emerging, and some home health aides already are playing a larger role in care coordination, management, coaching and

navigation.

Finally, the new \$15 per hour minimum wage for fast food workers in New York State can be expected to exert upward pressure in other lower paying fields. What effect this will have on the career progression throughout the labor market is still unknown. Here again, industry experts and representatives are invaluable partners because they can alert you to emerging trends that can and should be explained in the career maps.

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## About the New York City Labor Market Information Service

The New York City Labor Market Information Service housed at the Center for Urban Research at the City University of New York Graduate Center, was founded in 2008. The NYCLMIS helps workforce, education, and economic development professionals and policy makers to make data-driven decisions. To accomplish our mission, we produce rigorous, multi-method research reports, develop career planning tools, and provide technical assistance and strategic consulting services. Through its research and ongoing contact with industries, the NYCLMIS team has cultivated a deep understanding of New York City's sectors and the workforce needs within them. We also remain firmly grounded in practice by maintaining close ties with the professionals we serve.

## About the CUNY CareerPATH Initiative

The CUNY CareerPATH Initiative was a low to no-cost program supporting adult workers without jobs and adults workers looking to advance their careers by providing opportunities to 1) earn both industry-recognized credentials and college credits, and 2) find jobs or enter college in one of five fields: Business, Education, Food Service & Hospitality, Healthcare, and Manufacturing. The programs were offered at eight colleges for three years ending in September 2015.

In order to ensure career advancement and successful college transition, CUNY CareerPATH participants were given career-focused academic and English-language instruction, occupational training leading to industry-recognized credentials, and college credits, academic advising, and career coaching and employment assistance.



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