



Health Career Pathways: Results from a Survey of Pittsburgh Area Healthcare Professionals and Students

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A Supporting Organization of the Jewish Healthcare Foundation

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Executive Summary

Health Careers Futures (HCF) initiated a study to investigate how and why healthcare professionals, specifically imaging, laboratory, and respiratory therapy workers, enter their chosen careers. The study is part of a larger campaign to increase entrants into health careers in the Pittsburgh region. Six hundred and seventy-six incumbent workers from 13 different hospitals and 131 students in training at a regional community college completed surveys.

Research Questions

Workers were asked: 1) how they became interested in their occupation; 2) how long they entered training after identifying their interest in the profession; 3) their demographics and educational backgrounds; and 4) what factors were important in leading them to choose a health professions career. Students completed similar questionnaires, with questions about training experience included instead of work experience.

Major Findings

Demographics: Both incumbent workers and students were predominantly white females. Incumbent workers were more likely to be 40-49 years of age while most students were 18-29 years old.

Career Pathway: Most workers in the targeted fields fit a traditional career entry scenario: they entered at an early age, and had little or no prior healthcare work experience. Most students had some prior healthcare work experience. Almost all students and incumbent workers reported altruistic reasons and ample job opportunities as reasons for choosing a health profession.

Sources of Career Information: Students reported being much more influenced than incumbent workers by the media and Internet in making their career decision. Two-thirds of incumbent workers and almost three-quarters of students reported that they received advice from a friend or relative on entering a healthcare profession.

Advocacy for the Profession: Forty-seven percent of laboratory workers and 41% of radiation therapy students reported that they would not recommend their profession to a friend or relative.

Recommendations

Diversity: The imaging, laboratory, and respiratory fields, like most healthcare fields, lack gender and racial/ethnic diversity. Recruitment strategies targeting these underrepresented populations should be explored. At present, only a minority of workers appear to be entering these fields as a mid-life career change or by upgrading their skills from a lower level healthcare profession.

Career Pathway Education: Educating incumbent and potential workers about career advancement pathways is an important area to address in both recruitment and retention initiatives.

Recruitment: Opportunities to capitalize on the use of the media in recruitment campaigns, particularly the Internet, should be examined. The most important sources of advice or

information for students and workers about these careers are friends or relatives. Effective recruitment strategies should include the networking efforts of incumbent workers.

Advocacy for the Profession: The reasons for high numbers of laboratory works and radiation therapy students to not recommend their career path should be elucidated. The desires to help people and to be in a field with a lot of job opportunities are central to workers' decisions to enter health professions. Using these motivations as the main themes for recruitment campaigns is recommended.

Current Action

Health Careers Futures is using the current regional results and recommendations to identify target audiences and develop marketing campaigns for a health professions recruitment initiative in Southwestern Pennsylvania. Creating a mechanism to identify applicants who will succeed in training as well as their chosen healthcare career is an important next step. Determining what financial assistance will provide the most incentive to recruits and the most benefit to students is also critical. As job vacancy rates increase, identifying effective methods to recruit and retain quality workers becomes more and more vital.

Introduction

In the fall of 2003 Health Careers Futures (HCF) embarked on a focused research initiative to obtain a better understanding of how and why healthcare professionals enter their chosen careers. The data collected through this effort are intended to drive targeted interventions to increase interest, and ultimately new entrants, in health careers.

The initial focus of this research effort is on high-demand therapist and technician/technologist occupations that typically require two years of training. Although these are well-paying occupations and are in high demand, they are not as visible as other health careers. In turn, little information is available about the types of people who enter these fields and how they came to choose them.

Targeted Occupations

The nine occupations listed below are the focus of this initial phase of research. Approximately 5,630 individuals work in these occupations in the Pittsburgh metropolitan area. Nearly 200 openings are forecasted annually for these occupations through 2010.ⁱ In 2003, hospitals in Western Pennsylvania reported vacancy rates in excess of 5% for six of these occupations.ⁱⁱ The vacancy rates for five of these occupations exceeded the 6.3% vacancy rate for Registered Nurses.

- Cardiovascular Technologist
- Medical Laboratory Technicians
- Medical Laboratory Scientists and Technologists
- Radiological Technicians and Technologists
- Diagnostic Medical Sonographers
- Nuclear Medicine Technologists
- Radiation Therapists
- Radiological, CT, or MRI Technologists
- Respiratory Therapists

Research Questions

This initiative seeks to address the following central research questions:

- When do people become interested in the targeted occupations?
- How long does it take people who are interested in an occupation to enter a training program?
- What are the demographic and educational backgrounds of individuals who pursue the targeted occupations?
- What role do the media play in shaping the career choices?
- What role do academic, personal and extracurricular experiences play in shaping career choices?

Methodology

A two-page Health Career Pathways Survey was developed by HCF research staff in collaboration with representatives of the region's major healthcare employers and training organizations. The survey was also reviewed by an independent researcher in the field of workforce development. Two versions of the survey were created, one for incumbent workers and the other for students currently in training for one of the targeted occupational areas. The two versions only main differences are in the phrasing of questions related to work history and training experience.

The incumbent worker version of the Pathways Survey was administered to individuals currently employed in 13 hospitals associated with four health systems in Western Pennsylvania. Most of these facilities are located in the Pittsburgh metropolitan area, although two facilities are located in outlying counties. Human Resources staff or department heads coordinated the distribution of surveys at each facility. Approximately 1,051 incumbent worker surveys were distributed from late January to early March 2004.

Each incumbent worker survey was accompanied by a return envelope and a cover letter from a manager within the partner health system encouraging participation. The cover letters and the survey itself assured respondents of the confidentiality of their responses. Respondents were asked to seal their completed surveys in the envelope prior returning them to the site contact person. Respondents were also given the option to mail their surveys directly to Health Careers Futures.

The student version of the Pathways Survey was disseminated in classes by course instructors at the Community College of Allegheny County (CCAC), a major training provider for the targeted occupations. These surveys were administered during the same time period as incumbent worker version. The surveys were returned to the course instructor. There was no accompanying cover letter or envelope with the student version.

It is important to note that both the incumbent worker and student versions of the survey were administered to samples of convenience rather than a random sample of a population of individuals in the targeted occupations.

Results of the Incumbent Worker Survey

The overall response rate for the incumbent worker survey was 64%. This figure is a conservative estimate based on the number of surveys provided to the health systems. To minimize the burden of participation we did not require the work sites to verify that every survey was received by a worker. All of the participating health systems had strong response rates, ranging from 53% to 69%. The health system with the most responses (N=411) accounted for 61% of all respondents (N=676). Each of the major occupational areas also had response rates well over 50% (Table 1).

As shown in Table 2, the number of respondents in some of the targeted occupations was small. Moreover, several of the targeted occupations are closely related and the respondents answered in similar ways. In this report the incumbent survey results are aggregated into three occupational areas: Imaging, Laboratory, and Respiratory. Note that tables reporting percentages may not total 100% due to rounding.

Three of the four participating health systems distributed surveys to workers in all three occupational areas, while the fourth system distributed surveys only to imaging and respiratory therapy incumbents.

Table 1. Survey Response Rates

Occupational Area	Est. Number of Surveys Distributed	Number of Surveys Returned	Response Rate
Imaging*	519	330	64%
Laboratory**	314	218	69%
Respiratory***	218	126	58%
Total	1051	676	64%

* Imaging includes the following occupations: Cardiovascular Technologist, Diagnostic Medical Sonographer, Nuclear Medicine Technologist, Radiation Therapist, and Radiologic, CT, or MRI Technologist.

** Laboratory includes the following occupations: Medical Laboratory Technician, Medical Laboratory Scientist, and Medical Laboratory Technologist.

*** Respiratory includes the occupation of Respiratory Therapist.

Table 2. Summary of Responses by Profession and Occupational Area

Profession	Occupational Area					
	Imaging		Laboratory		Respiratory	
	Count	%	Count	%	Count	%
Cardiovascular Technologist	18	5%	--	--	--	--
Medical Laboratory Technician	--	--	70	32%	--	--
Medical Laboratory Scientist/Technologist	--	--	148	68%	--	--
Diagnostic Medical Sonographer	51	15%	--	--	--	--
Nuclear Medicine Technologist	27	8%	--	--	--	--
Radiation Therapist	22	7%	--	--	--	--
Radiological, CT, or MRI Technologist	212	64%	--	--	--	--
Respiratory Therapist	--	--	--	--	126	100%
Total	330	100%	218	100%	126	100%

Respondent Characteristics

The modal age range of incumbent workers is 40 to 49 years old, with over one-third (35%) of all respondents falling within this span (Table 3). Forty-three percent of workers in the targeted occupations are under age 40. Workers in medical laboratory occupations tend to be older than those in imaging and respiratory occupations, with 71% being 40 or over. Over three-quarters of the workers in these professions were women. The laboratory occupations are particularly dominated by women (86%), while men were most represented in the respiratory field at 41%. Racial and ethnic minorities are underrepresented in all of the occupational areas, constituting no more than 5% of workers in any category. Minorities make up over 14% of the population in Allegheny County, while outlying county percentages range from 1% to 6%.ⁱⁱⁱ

Table 3. Demographic Characteristics of Incumbent Workers

		Occupational Area							
		Imaging (N=330)		Laboratory (N=218)		Respiratory (N=126)		Total (N=676)	
		Count	%	Count	%	Count	%	Count	%
Age	18-29	65	20%	13	6%	28	22%	106	16%
	30-39	96	29%	51	23%	32	25%	179	27%
	40-49	104	32%	83	38%	45	36%	232	35%
	50-59	60	18%	65	30%	18	14%	143	21%
	60+	2	1%	6	3%	3	2%	11	2%
Sex	Male	72	22%	31	14%	51	41%	154	23%
	Female	256	78%	187	86%	73	59%	516	77%
Race/ Ethnicity	African American	7	2%	3	1%	2	2%	12	2%
	Asian	0	0%	6	3%	1	1%	7	1%
	American Indian	0	0%	1	0%	0	0%	1	0%
	Hispanic/Latino	0	0%	0	0%	0	0%	0	0%
	White	314	97%	207	95%	120	96%	641	96%
	Other	4	1%	1	0%	2	2%	7	1%
County of Workplace	Allegheny	193	58%	133	61%	90	71%	416	62%
	Other*	137	42%	85	39%	36	29%	258	38%

* Other counties with facilities participating in the survey included Clearfield, Washington, Westmoreland, and Venango.

Workers' current workplace county and the county from which they graduated from high school has important implications for workforce recruitment and development efforts. Table 4 shows

that while a large percentage incumbents working in Allegheny County (52%) also graduated from high school in the county, a significant minority (28%) graduated from high school in neighboring counties. This reflects the general commuting patterns of the region. In contrast, only 7% of workers in the outlying counties graduated from a high school within Allegheny County, indicating that suburban counties are much more likely to draw their workforce from their own or other suburban counties than from Allegheny County.

It is important to note that the relatively high percentage of non-Allegheny County workers who report graduating from high school in “Another Area” (not Allegheny County or surrounding counties) is partly a reflection of the fact that two facilities participating in the survey were located outside the Pittsburgh metropolitan area (Clearfield and Venango Counties).

Table 4. Comparison for Workplace Location to County of High School Graduation

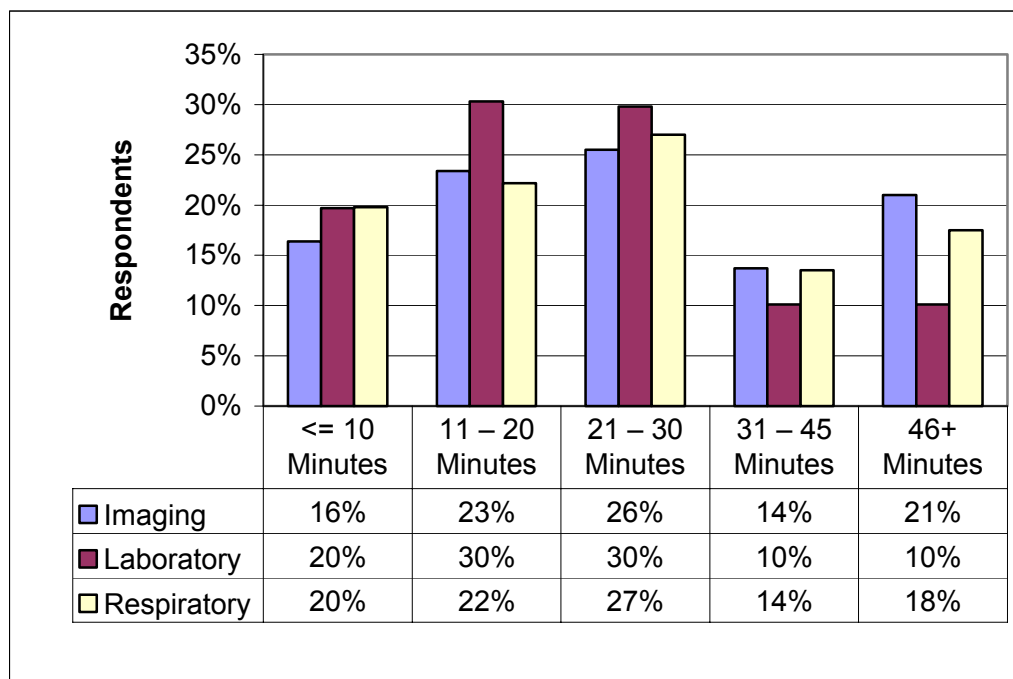
<i>Where did you graduate from high school or obtain your GED?</i>		County of Workplace					
		Allegheny		Other*		Total	
		Count	%	Count	%	Count	%
Imaging	In Allegheny County	107	55%	11	8%	118	36%
	In Armstrong, Beaver, Butler, Fayette, Washington, or Westmoreland County	55	29%	60	44%	115	35%
	Another area	31	16%	66	48%	97	29%
Laboratory	In Allegheny County	59	45%	3	4%	62	29%
	In Armstrong, Beaver, Butler, Fayette, Washington, or Westmoreland County	43	33%	48	57%	91	42%
	Another area	30	23%	33	39%	63	29%
Respiratory	In Allegheny County	49	54%	4	11%	53	42%
	In Armstrong, Beaver, Butler, Fayette, Washington, or Westmoreland County	17	19%	17	47%	34	27%
	Another area	24	27%	15	42%	39	31%
Total	In Allegheny County	215	52%	18	7%	233	35%
	In Armstrong, Beaver, Butler, Fayette, Washington, or Westmoreland County	115	28%	125	49%	240	36%
	Another area	85	21%	114	44%	199	30%
	Total	415	100%	257	100%	672	100%

* Other counties with surveyed facilities included Clearfield, Washington, Westmoreland, and Venango.

While incumbent workers demonstrate a preference for workplaces in or close to the counties where they graduated from high school, their commuting patterns are typical of other workers in

the region. The majority commute between 11 and 30 minutes to work, and nearly one-third commute more than 30 minutes. Laboratory professionals have the shortest commutes, with 80% typically taking 30 minutes or less to get to work.

Figure 1. Typical Commute Time to Work



Work History and Educational Background

The Health Career Pathways Survey captured key information about incumbent workers' work history and educational background in order to better understand the timing of career milestones. Specifically, the survey results help illuminate the paths taken by the targeted workers as they select healthcare as a career: When do people become interested in these careers? How long does it take them to pursue training once their initial interest takes hold? Have they worked in healthcare previously?

On average, incumbent workers have been working in their field for 17 years. Consistent with the older age distribution of laboratory workers, they also have the longest average tenure in the field at nearly 22 years. In comparison, the average tenure of imaging and respiratory workers is 15 and 14 years respectively. Only 8% of laboratory workers have been working in the field for 7 or fewer years, compared to one-quarter of imaging and respiratory workers (Figure 2).

Figure 2. Years in Current Profession

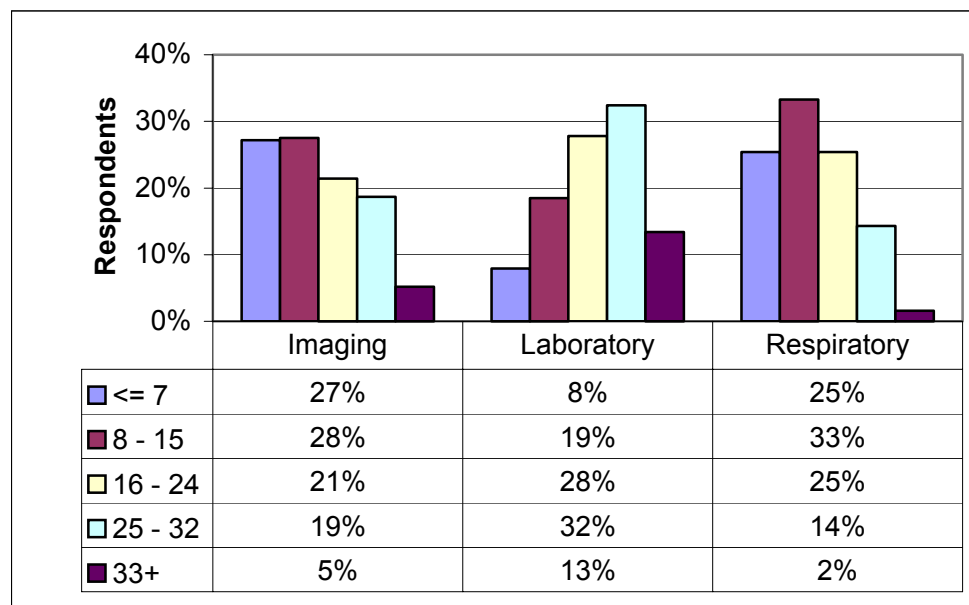


Table 5a. Interest and Engagement in a Healthcare Profession

		Occupational Area			
		Imaging	Laboratory	Respiratory	Total
Age when first became interested in a healthcare profession.	≤ 13	3%	14%	5%	7%
	14 - 20	69%	70%	48%	65%
	21 - 25	14%	10%	22%	14%
	26 - 35	10%	6%	21%	11%
	36+	4%	0%	4%	3%
Years from initial interest to beginning of training	≤ 0	39%	35%	38%	37%
	1 - 2	39%	34%	33%	36%
	3 - 7	18%	23%	22%	20%
	8 - 13	3%	7%	6%	5%
	14+	1%	1%	1%	1%
Years in a previous healthcare profession	No Prior Healthcare Experience	60%	84%	73%	70%
	1-2 Years Prior Experience	21%	7%	8%	14%
	3+ Years Prior Experience	19%	8%	19%	16%

The vast majority (72%) of incumbent workers became interested in a healthcare profession before the age of 21 (Table 5a). Respiratory professionals are the most likely to become interested in health care later in life. Forty-three percent of respiratory professionals report becoming interested in their profession between the ages of 21 and 35, compared to fewer than 25% in the imaging and laboratory areas. On average, workers began training 1.8 years after their initial interest. Most workers (70%) did not report working in health outside their current profession. Imaging professionals were the most likely (40%) to have had some other healthcare work experience. Even among imaging professionals, the average duration of other healthcare work experience was less than two years (Table 5b).

Table 5b. Interest and Engagement in a Healthcare Profession

		Occupational Area		
		Imaging	Laboratory	Respiratory
Age when first became interested in a healthcare profession.	Mean	19.4	17.0	20.8
	Median	18.0	17.0	19.0
	Std Deviation	5.9	4.5	6.6
Years from initial interest to beginning of training	Mean	1.6	2.2	1.8
	Median	1.0	1.0	1.0
	Std Deviation	2.3	3.3	3.1
Years in a previous healthcare profession	Mean	1.7	.4	1.4
	Median	.0	.0	.0
	Std Deviation	3.7	2.0	3.3

While all of the targeted occupational areas can be pursued without a four-year college degree, there are notable differences across the three areas in the level of educational credentials held by the typical worker (Table 6). Nearly two-thirds (62%) of practicing laboratory workers have at least a bachelor's degree, compared to 45% of respiratory workers and only 18% of imaging workers. A high school degree is the highest degree completed by 30% of those working in imaging. The imaging field relies much more heavily on non-degree professional certifications or diploma programs than either of the other fields. However, the data suggest that an associate's degree is becoming the normative credential even in this field, as younger workers are much less likely than older workers to hold only a high school degree.

Table 6. Educational Background

		Occupational Area			
		Imaging	Laboratory	Respiratory	Total
Highest degree completed	High School/GED	30%	14%	3%	19%
	Associate's Degree	51%	24%	52%	42%
	Bachelor's Degree	17%	57%	39%	35%
	Graduate Degree	1%	5%	6%	3%
Completed a non-degree healthcare professional certification or diploma program	No	46%	61%	75%	56%
	Yes	54%	39%	25%	44%

The types of degrees held by current workers do not tell the full story of what types of institutions are providing the training necessary for enter the imaging, laboratory or respiratory professions. Incumbent workers were also asked to indicate all of the institutions they attended for necessary professional training. This question was somewhat subjective in that respondents may have had varied interpretations of what was required. Also, some may have considered their clinical internships to be “hospital-based programs.” Nevertheless, the results in Table 7 reveal some interesting patterns.

While over half of imaging professionals hold an associate’s degree, only 34% report receiving required training from a community college. Hospital-based programs appear to be providing a substantial portion of the training for imaging professionals (65%). Community colleges are the primary training institution for respiratory therapists (48%), followed closely by four-year colleges or universities (41%). Laboratory professionals were nearly equally likely to indicate that they received required training from a four-year institution (64%) as from a hospital-based program (68%). Few respondents in any of the occupational areas reported receiving required training from their high school, a vocational school, training center, or from a graduate school.

Table 7. Types of Institutions Providing Required Training*

Training Institution	Occupational Area			
	Imaging	Laboratory	Respiratory	Total
High school	15%	17%	10%	15%
Vocational school or training center	7%	6%	12%	8%
Community college	34%	18%	48%	32%
Hospital-based program	65%	68%	33%	60%
Four-year college or university	22%	64%	41%	39%
Graduate school	1%	2%	2%	1%

* Respondents could indicate multiple institutions.

Advocacy for the Profession

The level of advocacy for a profession among current workers is an important factor in attracting new workers to that profession. Current workers can be the most persuasive promoters of their profession, especially given the importance of personal contacts in the career decision-making process. Moreover, efforts to recruit new workers for a profession with high levels of dissatisfaction may be wasted if those new workers quickly become disenchanted and leave, resulting in high attrition.

To assess current attitudes about each occupational area, the Pathways Survey included a single general question about whether incumbent workers would recommend their profession to a friend or relative. Three response options were provided: yes, maybe, and no. Responses of “maybe” should not be interpreted as reflecting a lack of enthusiasm for the profession since some respondents may have felt that their decision to recommend the profession might vary depending on the talents and interests of the individual. However, responses of “No” are more clearly a cause for concern as they suggest a low level of advocacy for the profession among current workers.

Only 16% of imaging workers, and 23% of those in the respiratory area, indicated that they would not recommend their profession (Table 8). In contrast, nearly half of laboratory incumbent workers (47%) would not recommend their profession to a friend or relative. Fewer than one in five laboratory workers said that they would recommend their field. The more negative attitudes of laboratory workers may be partly attributable to the older average age of the workforce. The results in Table 9 show that advocacy for these occupations dips overall among older workers. However, even when the survey results for workers under age 30 are analyzed, the pattern of high advocacy among imaging and respiratory workers and low advocacy among laboratory workers persists. Laboratory workers under age 30 are twice as likely (39%) as those in the respiratory area (18%), and five times more likely than those in imaging (8%), to say they would not recommend their field.

Table 8. Percentage of Respondents Who Would Recommend their Profession to a Friend or Relative by Occupational Area

Would Recommend?	Occupational Area			
	Imaging	Laboratory	Respiratory	Total
Yes	55%	19%	42%	41%
Maybe	30%	35%	35%	32%
No	16%	47%	23%	27%

Table 9. Percentage of Respondents Who Would Recommend their Profession to a Friend or Relative by Age

Would Recommend?	Age					
	18-29	30-39	40-49	50-59	60+	Total
Yes	51%	41%	40%	35%	42%	41%
Maybe	35%	34%	29%	34%	25%	32%
No	14%	25%	31%	31%	33%	27%

The Pathways survey was not designed to explain dissatisfaction among workers. However, in open-ended comments some laboratory workers indicated that jobs in this field were no longer plentiful and that salaries were low. This is an important area for further investigation for the laboratory field if future recruitment and retention efforts are going to prove successful.

Reasons for Entering Healthcare

Individual career choices may be influenced by a wide range of factors. The Pathways Survey asked incumbent workers to rate the importance of various factors on a four-point scale: “Not Important,” “Of Little Importance,” “Moderately Important,” and “Very Important.” In Table 10 the percentage of workers indicating moderately or very important is summarized for each factor.

High school and post-high school career academic/career counseling appears not to have been a major influence on current workers in the targeted professions. This may represent a missed opportunity that could be better exploited in the future by making academic and career guidance professionals more aware of the opportunities available in these occupational areas. Advice and information from a friend or relative is reported as having been moderately or very important to over half of workers in all three occupational areas. It is noteworthy, however, that only 51% of laboratory workers rated this as an important factor compared to well over 70% of imaging

and respiratory workers. This may be a reflection of the differences in advocacy observed across the professions.

In general, the media was not an important influence on most workers' career choice (Table 10). Many incumbent workers made their career decisions before the advent of the Internet, and therefore were not strongly influenced by this medium. However, among workers under the age of 30, 42% indicated that the information from the Internet was a moderate or very important factor. Job fairs were a factor for over 40% of imaging and respiratory workers, but less of a factor for laboratory workers (25%).

Table 10. Factors Influencing the Decision to Enter a Healthcare Profession

“Moderately” or “Very Important” Factors	Occupational Area			
	Imaging	Laboratory	Respiratory	Total
Advice or Information from a(n):				
High school guidance counselor	32%	26%	29%	30%
High school teacher	24%	32%	23%	26%
Academic/career counselor (after H.S.)	38%	32%	36%	36%
Friend or relative	74%	51%	76%	67%
Information from:				
The Internet	26%	10%	26%	21%
A career or job fair	42%	25%	43%	37%
Television or radio commercials	16%	4%	22%	13%
Movie, television or radio program	12%	8%	17%	12%
An article in a newspaper or magazine	28%	20%	29%	25%
An advertisement in a newspaper or magazine	22%	14%	24%	20%
A letter or advertisement received by mail	20%	9%	21%	17%
Personal experience:				
In a prior healthcare job	41%	25%	50%	38%
As a volunteer or intern	40%	28%	37%	36%
Being a patient or a family member being a patient	53%	29%	64%	47%
An extracurricular experience in grade school or high school	28%	26%	28%	27%
You wanted a profession that:				
Requires less than four years of training	65%	34%	50%	53%
Pays well	93%	90%	96%	93%
Has plenty of jobs	93%	90%	97%	93%
Helps people	93%	90%	95%	93%
Has opportunities for career advancement	83%	78%	83%	82%

Personal experiences motivated a significant share of imaging and respiratory workers to choose their profession. In particular, having been a patient or a family member of a patient was moderately or very important to 53% of imaging workers and 64% of respiratory workers. Only 29% of laboratory workers rated this as an important factor. Extracurricular activities in grade school or high school were rated as important factors by only one-quarter (27%) of workers across all of the occupational areas.

Incumbent workers almost universally report that it was important for them to choose a profession that pays well, has plenty of jobs, and helps people. Ninety percent or more of workers indicated that these were important issues for them. Choosing a profession that has “Opportunities for career advancement” was rated as important by 82% of workers. The time required for training (specifically, requiring less than four years) was less universally rated as important; although the majority of respiratory (50%) and imaging workers (65%) still indicated it was moderately or very important.

The Pathways survey asked workers to state in their own words the single most important reason they entered a healthcare profession. For analysis purposes these comments were reviewed and grouped into several categories of similar responses. Although the question asked for the single most important reason, many workers listed more than one reason. Up to three reasons per respondent were recorded for analysis. Some workers provided no response to this question, and are excluded from this analysis. Table 11 shows the “most important reasons” and the percentage (of those writing a response) who noted each reason.

Across all three occupational areas, “helping people” is the top reason given for entering a healthcare profession. One in three incumbent workers gave a reason that fell into this category, which included comments such as “I wanted to be in a service profession” or “to contribute something.” Comments related to job security or the large supply of jobs were made by 24% of incumbent workers. Laboratory workers are much more likely to have been motivated to choose their profession by their interest in the field or their affinity for math/science than either imaging or respiratory workers. While all of the targeted occupations require the use of advanced technology as well as a strong math and science education, only laboratory workers consistently noted this as a “most important” factor in their career decision.

Table 11. Most Important Reasons for Entering a Healthcare Profession*

Open-Ended Responses	Occupational Area							
	Imaging		Laboratory		Respiratory		Total	
	Count	%	Count	%	Count	%	Count	%
Help people, service profession, contribute	99	41%	48	26%	36	38%	183	35%
Financial reasons, money, good pay	39	16%	17	9%	13	14%	69	13%
Interesting field, enjoyable, challenging, variety	22	9%	27	14%	5	5%	54	10%
Like science/math, find science, math, technology interesting	12	5%	44	23%	3	3%	59	11%
Job security, plenty of jobs	58	24%	43	23%	27	28%	128	24%
Be part of the healthcare team, wanted health profession, help doctors	7	3%	15	8%	1	1%	23	4%
Career opportunities, opportunities for advancement	13	5%	6	3%	8	8%	27	5%
Shorter training, affordable training, could start working sooner	20	8%	11	6%	6	6%	37	7%
Personal health experience, or with sick family member/relative	15	6%	15	8%	14	15%	44	8%
Flexible schedules	11	5%	3	2%	2	2%	16	3%
Interacting with people	18	7%	5	3%	4	4%	27	5%
Important work, respected, work I can feel good about	21	9%	9	5%	1	1%	31	6%
Other reason given	8	3%	8	4%	4	4%	20	4%
<i>Total Number of Responses</i>	343		251		124		718	

* Based on 526 respondents providing at least one reason, up to three reasons coded per respondent.

Results for Health Profession Students

The Health Career Pathways Survey for health professions students was very similar to the version administered to incumbent workers, differing only in the wording of certain questions to make them suitable for individuals still in training. The overall objective of the survey was the same. By supplementing the incumbent worker survey with a student version we have obtained a glimpse of the characteristics and motivations of the most recent cohort of individuals entering healthcare.

There are important limitations associated with the student version of the survey. The student survey was not part of the original Health Career Pathways research plan. It was pursued when an opportunity arose during the course of the incumbent survey administration. As a consequence, the survey was administered at only one academic institution and only to students in imaging-related programs. While over a hundred students responded to the survey (Table 12), the subgroups in each profession are small and therefore the subgroup results must be considered with particular caution. Observed difference between the subgroups may well be an artifact of small sample sizes. Due to the extremely small number of Cardiovascular Technologist respondents (N=2), results for this subgroup are not reported separately but are included in the table totals. Note that tables reporting percentages may not total 100% due to rounding.

Table 12. Number and Percent of Student Responses by Training Profession

Training Profession	Count	%
Cardiovascular Technologist	2	2%
Diagnostic Medical Sonographer	50	38%
Nuclear Medicine Technologist	21	16%
Radiation Therapist	22	17%
Radiological, CT, or MRI Technologist	36	28%
Total	131	100%

Respondent Characteristics

As would be expected of a student cohort, the majority of respondents (52%) are between the ages of 18 and 29 (Table 13). Forty percent are between ages 30 and 49. As with the incumbent workers, the vast majority of health professions students are white (94%) and female (72%). If these findings are indicative of the broader training pipeline for imaging workers in Southwestern Pennsylvania, it would suggest that there is much work to be done to diversify the pool of workers drawn to this occupational area.

Table 13. Demographic Characteristics of Students

		Training Profession									
		Diagnostic Medical Sonographer		Nuclear Medicine Technologist		Radiation Therapist		Radiological, CT, or MRI Technologist		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
Age	18-29	28	58%	10	48%	15	68%	13	36%	67	52%
	30-39	10	21%	10	48%	2	9%	13	36%	35	27%
	40-49	4	8%	1	5%	4	18%	7	19%	17	13%
	50-59	6	13%	0	0%	1	5%	3	8%	10	8%
	60+	0	0%	0	0%	0	0%	0	0%	0	0%
Sex	Male	7	14%	6	30%	7	32%	15	42%	36	28%
	Female	43	86%	14	70%	15	68%	21	58%	94	72%
Race/ Ethnicity	African American	0	0%	0	0%	1	5%	0	0%	1	1%
	Asian	2	4%	0	0%	0	0%	0	0%	3	2%
	American Indian	0	0%	0	0%	0	0%	0	0%	0	0%
	Hispanic/Latino	0	0%	1	5%	0	0%	0	0%	1	1%
	White	48	96%	17	81%	21	95%	36	100%	123	94%
	Other	0	0%	3	14%	0	0%	0	0%	3	2%

Although the student survey was administered at an educational institution in Allegheny County, only 39% of students had received their high school degrees in that county (Table 14). Students are clearly willing to travel significant distances to attend classes for these professions. Typical commuting times for students are significantly longer than for incumbent workers (Table 15). Well over half (57%) commute more than 30 minutes from home to their training class. A striking 47% typically commute more than 45 minutes. While the willingness of students to commute significant distances to receive training is a strong indicator of the value they place on this education, it may also indicate a shortage of convenient training locations. This may be a significant barrier to many potential students.

Table 14. Comparison for Workplace Location to County of High School Graduation

<i>Where did you graduate from high school or obtain you GED?</i>	Training Profession									
	Diagnostic Medical Sonographer		Nuclear Medicine Technologist		Radiation Therapist		Radiological, CT, or MRI Technologist		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%
In Allegheny County	22	45%	10	48%	4	18%	14	39%	51	39%
In Armstrong, Beaver, Butler, Fayette, Washington, or Westmoreland County	15	31%	2	10%	6	27%	15	42%	38	29%
Another area	12	25%	9	43%	12	55%	7	19%	41	32%
Total	49	100%	21	100%	22	100%	36	100%	130	100%

Table 15. Typical Time to Get from Home to College/Training Class

Minutes	Training Profession				
	Diagnostic Medical Sonographer	Nuclear Medicine Technologist	Radiation Therapist	Radiological, CT, or MRI Technologist	Total
<= 10	6%	21%	5%	6%	8%
11 - 20	20%	16%	18%	19%	20%
21 - 30	14%	26%	18%	8%	15%
31 - 45	14%	5%	9%	8%	10%
46+	46%	32%	50%	58%	47%

Work History and Educational Background

As with incumbent workers, a strong majority of students (61%) became interested in a healthcare profession between the ages of 14 and 25 (Table 16a). For over 70% of students the time between initial interest and the beginning of training was two years or less. However, a significant share of current students did have some, albeit brief, prior work experience in healthcare. Students reported an average of one to three years of prior work experience (Table 16b), with 43% indicating any prior healthcare experience. Students in training for radiological technology were the least likely to report prior healthcare experience. Radiological technologist is the most common entry level position in the imaging field. The other surveyed professions are often avenues of advancement for individuals already practicing as radiological technologists.

Table 16a. Interest and Engagement in a Healthcare Profession

		Training Profession				
		Diagnostic Medical Sonographer	Nuclear Medicine Technologist	Radiation Therapist	Radiological, CT, or MRI Technologist	Total
Age when you first became interested in a healthcare profession	<= 13	4%	5%	5%	6%	5%
	14 - 20	46%	48%	45%	33%	42%
	21 - 25	24%	14%	27%	8%	19%
	26 - 35	12%	29%	9%	31%	19%
	36+	14%	5%	14%	22%	15%
Years from initial interest to beginning of training	<= 0	45%	50%	45%	28%	40%
	1 - 2	37%	25%	27%	36%	33%
	3 - 7	6%	15%	14%	17%	12%
	8 - 13	8%	5%	9%	14%	10%
	14+	4%	5%	5%	6%	5%
Years in a previous healthcare profession	No Prior Healthcare Experience	54%	53%	41%	74%	57%
	1-2 Years Prior Experience	21%	32%	27%	6%	19%
	3+ Years Prior Experience	26%	16%	32%	20%	24%

Table 16b. Interest and Engagement in a Healthcare Profession

		Training Profession			
		Diagnostic Medical Sonographer	Nuclear Medicine Technologist	Radiation Therapist	Radiological, CT, or MRI Technologist
Age when you when first became interested in a healthcare profession	Mean	23.0	22.2	23.5	27.2
	Median	20.0	19.0	20.0	25.0
	Std Deviation	9.5	7.1	10.8	10.9
Years from initial interest to beginning of training	Mean	2.3	2.4	2.5	3.8
	Median	1.0	1.0	1.0	1.0
	Std Deviation	4.9	5.5	4.8	6.2
Years in a previous healthcare profession	Mean	1.1	1.4	2.5	1.1
	Median	.0	.0	2.0	.0
	Std Deviation	4.5	5.8	5.1	5.2

Over half (55%) of students in the surveyed programs already have an associate's degree or more (Table 17). Only 20% have received any type of non-degree healthcare certification or diploma. It is not surprising that virtually all of the students reported that they received required training from a community college (Table 18). As with the incumbent workers, high school was rarely noted as a source of training.

Table 17. Educational Background

		Training Profession				
		Diagnostic Medical Sonographer	Nuclear Medicine Technologist	Radiation Therapist	Radiological, CT, or MRI Technologist	Total
Highest degree completed	High School/GED	48%	24%	57%	49%	45%
	Associate's Degree	26%	43%	29%	31%	31%
	Bachelor's Degree	22%	29%	14%	17%	21%
	Graduate Degree	4%	5%	0%	3%	3%
Non-degree healthcare professional certification or diploma program	No	81%	90%	55%	89%	80%
	Yes	19%	10%	45%	11%	20%

Table 18. Types of Institutions Providing Required Training*

Training Institution	Training Profession				
	Diagnostic Medical Sonographer	Nuclear Medicine Technologist	Radiation Therapist	Radiological, CT, or MRI Technologist	Total
High school	12%	10%	18%	3%	10%
Vocational school or training center	10%	10%	0%	11%	8%
Community college	88%	86%	86%	94%	89%
Hospital-based program	18%	14%	64%	3%	21%
Four-year college or university	14%	29%	0%	6%	11%
Graduate school	2%	10%	0%	0%	2%

* Respondents could indicate multiple institutions.

Advocacy for the Training Program

The vast majority (73%) of students would recommend their training program to a friend or relative (Table 19), indicating a high level of satisfaction with, and willingness to advocate for, the programs. Only 12% reported that they would not recommend their program. The proportion not recommending the program was highest among radiation therapists (41%). This finding must be considered with caution given the relatively small number of respondents in this training program.

Table 19. Percentage of Respondents Who Would Recommend their Training Program to a Friend or Relative by Training Profession

	Training Profession				
	Diagnostic Medical Sonographer	Nuclear Medicine Technologist	Radiation Therapist	Radiological, CT, or MRI Technologist	Total
Yes	86%	75%	27%	80%	73%
Maybe	4%	25%	32%	17%	16%
No	10%	0%	41%	3%	12%

Reasons for Entering Healthcare

Overall, the factors influencing current students' decisions to enter the healthcare profession do not differ substantially from incumbent workers (Table 20). Advice or information from a friend or relative is "moderately" or "very" important for 74% of students. Also like incumbent workers, students are nearly universally seeking a field that helps people and offers job security. Two elements of the media appear to be more influential among students than incumbent workers. The Internet was rated as "moderately" or "very" important by 57% of students, compared to 21% of incumbent workers. Newspaper/magazine articles were cited as important by 41% of students compared to only 25% of incumbent workers. Personal experiences as a patient or as a family member of a patient were also rated as being important by notably more students than incumbent workers (71% and 47%, respectively). Post-high school academic counselors are also an important source of information for 44% of students, compared to 36% of incumbent workers.

When asked to describe the most important factor in their decision to enter healthcare, reasons related to helping people (44%) and the availability of jobs (30%) were most frequently mentioned (Table 21). Comments related to opportunities for career advancement were also noted by a large number of students (27%). This was mentioned as a top reason for entering the field by only 5% of incumbent workers.

Table 20. Factors Influencing the Decision to Enter a Healthcare Profession

“Moderately” or “Very Important” Factors	Training Profession				
	Diagnostic Medical Sonographer	Nuclear Medicine Technologist	Radiation Therapist	Radiological, CT, or MRI Technologist	Total
Advice or Information from a(n):					
High school guidance counselor	19%	24%	14%	12%	17%
High school teacher	23%	33%	27%	21%	25%
Academic/career counselor (after H.S.)	41%	52%	32%	50%	44%
Friend or relative	82%	62%	73%	71%	74%
Information from:					
The Internet	63%	52%	50%	56%	57%
A career or job fair	35%	38%	27%	36%	35%
Television or radio commercials	25%	14%	14%	21%	20%
Movie, television or radio program	13%	14%	9%	18%	14%
An article in a newspaper or magazine	56%	35%	32%	29%	41%
An advertisement in a newspaper or magazine	33%	33%	18%	29%	30%
A letter or advertisement received by mail	29%	19%	18%	18%	23%
Personal experience:					
In a prior healthcare job	50%	48%	55%	34%	47%
As a volunteer or intern	53%	52%	27%	31%	43%
Being a patient or a family member being a patient	76%	57%	73%	69%	71%
An extracurricular experience in grade school or high school	24%	24%	27%	17%	22%
You wanted a profession that:					
Requires less than four years of training	82%	52%	68%	75%	73%
Pays well	100%	100%	95%	92%	97%
Has plenty of jobs	100%	95%	100%	100%	99%
Helps people	96%	90%	95%	100%	96%
Has opportunities for career advancement	92%	95%	95%	100%	95%

Table 21. Most Important Reasons for Entering a Healthcare Profession*

Open-Ended Responses	Training Profession								Total**	
	Diagnostic Medical Sonographer		Nuclear Medicine Technologist		Radiation Therapist		Radiological, CT, or MRI Technologist			
	Count	%	Count	%	Count	%	Count	%	Count	%
Help people, service profession, contribute	10	31%	8	44%	12	71%	13	45%	43	44%
Financial reasons, money, good pay	5	16%	3	17%	1	6%	4	14%	13	13%
Interesting field, enjoyable, challenging, variety (general)	3	9%	4	22%	1	6%	4	14%	12	12%
Like science/math, find science, math, technology interesting	5	16%	1	6%	1	6%	1	3%	8	8%
Job security, plenty of jobs	13	41%	5	28%	4	24%	7	24%	29	30%
Be part of the healthcare team, wanted health profession, he	3	9%	0	0%	1	6%	1	3%	5	5%
Career opportunities, opportunities for advancement	6	19%	4	22%	3	18%	13	45%	26	27%
Family/friend in healthcare	1	3%	0	0%	0	0%	0	0%	1	2%
Shorter training, affordable training, could start working s	2	6%	0	0%	0	0%	0	0%	2	2%
Interacting with people	0	0%	1	6%	2	12%	3	10%	6	6%
Important work, respected, work I can feel good about	3	9%	2	11%	0	0%	1	3%	6	6%
	51		28		25		47		152	

* Based on 97 respondents providing at least one reason, up to three reasons coded per respondent.

** Cardiovascular Technologist not reported due to the small number of responses.

Conclusions and Recommendations

The Health Career Pathways Survey results provide valuable information about the background and experiences of current workers and students in key healthcare professions in Southwestern Pennsylvania. Health Careers Futures has gained a better understanding of how, when and why individuals choose healthcare careers, specifically imaging, laboratory, and respiratory therapy professions. The survey findings provide insights that can be used to develop strategies to recruit and retain workers in these fields. The following are some particularly notable findings and recommendations for healthcare workforce planners and decision makers to consider in designing recruitment campaigns:

- The imaging, laboratory, and respiratory fields, like most of health care fields, lack gender and racial/ethnic diversity. The student survey results indicate that this is not likely to change soon. Minority and male populations represent a large untapped pool of potential workers. Recruitment strategies targeting these populations should be explored.
- The laboratory field has low levels of incumbent worker advocacy, due at least in part to a perceived downturn in the job market. Additional research on this field could inform new, aggressive outreach and recruitment efforts.
- Most media have had little influence on workers' decisions to enter the imaging, laboratory and respiratory fields. However, this is likely due to a relative lack of media attention on these occupations. A targeted media promotion strategy could draw increased interest to these professions.
- Younger workers and current health professions students are much more likely than older workers to report that the Internet and print media were important to their career decisions. Opportunities to capitalize on these trends, particularly the use of the Internet, should be examined.
- The most important sources of advice or information about these careers are friends or relatives. This indicates that effective recruitment strategies include the networking efforts of incumbent workers. Partnering with regional professional associations and their members and strengthening their networking abilities could enhance recruitment efforts.
- Altruistic and practical considerations both play key roles in motivating workers to enter these professions. The desires to help people and to be in a field with a lot of job opportunities are central to workers' decisions to enter health professions. Using these motivations as the main themes for recruitment campaigns should be considered.
- Most workers in the targeted fields fit a traditional career entry scenario: they entered at an early age, and had little or no prior healthcare work experience. At present, only a minority of workers appear to be entering these fields as a mid-life career change or by upgrading their skills from a lower level healthcare profession. Incumbent workers should be made aware of the potential for pursuing advanced certification and specialization. Educating incumbent and potential workers about career advancement pathways warrants further exploration.
- The significant distances that imaging students are traveling suggests that limited training locations may be a barrier to others who may be interested in such training. Identifying convenient training locations for target recruitment audiences is an important next step.

These findings are already shaping the work of Health Careers Futures and the Southwestern Pennsylvania healthcare workforce cluster. Health Careers Futures is in the process of exploring these issues on a national level in conjunction with a national professional society.

The current results and recommendations will be especially important to use in identifying target audiences and developing marketing campaigns for health professions recruitment in Southwestern Pennsylvania. Creating a mechanism to identify applicants who will succeed in training as well as their chosen healthcare career is an important next step. Determining what financial assistance will provide the most incentive to recruits and the most benefit to students is also critical. As healthcare job vacancy rates increase, implementing effective methods to recruit and retain quality workers becomes more and more vital.

ⁱ PA Department of Labor and Industry, Long Term Occupational Projects 2000-2010.

ⁱⁱ Hospital Association of Pennsylvania, 2003 Vacancy Survey.

ⁱⁱⁱ U.S. Census Bureau, State and County Quick Facts for 2000.