Pima Community College Pathways to Healthcare Program: Implementation and Early Impact Report

Pathways for Advancing Careers and Education

OPRE Report No. 2017-10

April 2017

PACE
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Authors
Karen Gardiner, Abt Associates
Howard Rolston, Abt Associates
David Fein, Abt Associates
Sung-Woo Cho, Abt Associates

Submitted to:
Nicole Constance
Federal Project Officer
Office of Planning, Research and Evaluation
Administration for Children and Families
U.S. Department of Health and Human Services
Contract No. HHSP2332007913YC

Project Director: Karen Gardiner
Abt Associates Inc.
4550 Montgomery Ave.
Bethesda, MD 20814

Acknowledgements

The efforts of many individuals have been indispensable in the evaluation of Pathways to Healthcare. We are especially grateful to administrators and staff at Pima Community College for their commitment to improvement and evaluation. In particular, we thank Pathways to Healthcare program leaders Amanda Abens and Brian Stewart for their hard work and collegial spirit in working with the PACE project team to develop the study and support its data collection activities. We also owe a deep debt of gratitude to the hundreds of adults who volunteered to participate in the evaluation and shared their experiences with us in surveys and in-depth interviews.

We gratefully acknowledge financial support and technical guidance from the U.S. Department of Health and Human Services Administration for Children and Families (ACF). The Contracting Office's Representative Nicole Constance played a critical role in guiding the study and provided helpful comments on multiple drafts of this report. We also thank the following current and former ACF staff for their efforts on behalf of the study: Erica Zielewski, Nicole Deterding, Hilary Forster, Lauren Frohlich, Mark Fucello, Naomi Goldstein, Molly Irwin, Brendan Kelly, and Kim Stupica-Dobbs.

At Abt Associates, a large team contributed to the evaluation. David Judkins prepared the technical appendices and led the data analysis effort, with support from Douglas Walton, Thyria Alvarez and Valerie Benson. Former Abt staff member Whitney Engstrom designed and implemented random assignment procedures, and led implementation study data collection efforts. We also acknowledge useful feedback on early report drafts from Rob Olsen and Karin Martinson, assistance from Bry Pollack in editing the report, and support in production and graphic design from Erin Miles, Nazhin Beiramee, and David Dupree. Finally, we thank Daniel Kitrosser for coordinating schedules across successive report drafts.

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Overview

This report documents the implementation and early impacts of the Pathways to Healthcare program, operated by Pima Community College in Tucson, Arizona. Pathways to Healthcare is one promising effort to help low-income, low-skilled adults access and complete occupational training that can lead to increased employment and higher earnings. It is one of nine career pathways programs being evaluated under the Pathways for Advancing Careers and Education (PACE) study sponsored by the Administration for Children and Families.

The Pathways to Healthcare program consists of five elements:

(1) the mapping of 16 existing healthcare occupational training programs into five pathways, each incorporating a ladder that enables students to obtain stackable credentials;

(2) proactive advising such as career counseling;

(3) scholarships for tuition and books;

(4) two compressed basic skills programs that in one semester remediate students whose low skills prevented them from enrolling directly in training; and

(5) job search assistance.

Using a rigorous research design, the study found that Pathways to Healthcare increased the hours of occupational training and the credentials its participants received within the 18-month follow-up period. Future reports will examine whether these effects translate into gains in employment and earnings.

Primary Research Questions

- Was the intervention actually implemented as designed?
- How did services received differ between study participants who could access the Pathways to Healthcare program versus those who could not?
- What were the effects of access to Pathways to Healthcare on short-term educational outcomes: hours of occupational training received, credits received, and credentials received?

Purpose

The federal government projects that over the next 10 years, the fastest-growing occupations are in healthcare. Almost all jobs in healthcare require some level of postsecondary education or training. But many low-income, low-skilled adults face barriers to completing even short-term training for entry-level jobs.

Career pathways programs are designed to address barriers by providing well-defined training steps targeted to locally in-demand jobs, combined with a range of financial, academic, employment, and personal supports and services. To assess the effectiveness of a career pathways program such as Pathways to Healthcare, the PACE evaluation used an experimental design in which program applicants

were assigned at random to a "treatment" group who can access the program or a "control" group who cannot, then compared their outcomes.

Key Findings & Highlights

- The Pathways to Healthcare program was implemented mostly as intended. More than 60 percent of the treatment group participated in basic skills education or in occupational training. Nursing Assistant was the most commonly attended training.
- The treatment group attended significantly more hours of occupational training (the primary outcome measured in this report) than the control group. This was primarily because the treatment group enrolled in occupational training more often—in healthcare-related training.
- The treatment group was significantly more likely than the control group to participate in advising such as career counseling, to receive help arranging supports, and to receive job search assistance.
- The treatment group earned significantly more college credentials (degrees, certificates) than the control group.

Methods

The Pathways to Healthcare evaluation's implementation study examined the design and operation of the program and the treatment group's participation patterns, and its impact study measured differences in education and training and employment outcomes.

From February 2012 to February 2014, more than 1,200 program applicants were randomly assigned to either the treatment or the control group. The impact study used data from a follow-up survey at 18 months after random assignment and administrative records from Pima Community College.

Prior to estimating Pathways to Healthcare impacts, the research team published an analysis plan that organized and disciplined the number of statistical tests conducted so as to avoid the problem of "multiple comparisons" in which a potentially large number of the tests could reach conventional levels of statistical significance by chance. To address this issue, the team established three categories of hypotheses (confirmatory, secondary, and exploratory) and publicly registered primary and secondary outcomes prior to starting analyses.

Executive Summary

Over the next ten years, the demand for workers in healthcare jobs is expected to grow quickly as the population grows and ages.[1] Successfully meeting the need for more healthcare workers is important to both the national economy and providing quality healthcare to people. This also creates opportunities for low-income adults to find entry-level employment and advance to higher-skilled jobs. Almost all jobs in healthcare require some training after high school. Policymakers, workforce development organizations, educators, and other key stakeholders are very interested in how to enable the match between the nation's need for a skilled workforce and low-income adults' need for employment.

Pathways to Healthcare Program

This report offers early evidence on the implementation and impacts of one promising effort to meet both needs. The **Pathways to Healthcare** program, operated through a partnership between **Pima Community College** (PCC) in Tucson, Arizona, and **Pima County One Stop** (PCOS), the local workforce agency, aimed to help low-income adults in Pima County access occupational training in the growing healthcare field. Over its first 18 months, Pathways to Healthcare program participants were more likely than a randomly assigned control group who could not access the program to:

- attend more hours of college occupational training—the primary outcome measured in this report;
- enroll in occupational training; and
- earn college credentials (degrees, certificates)

The Administration for Children and Families (ACF), within the U.S. Department of Health and Human Services, awarded a five-year grant in 2010 to fund the program under the **Health Profession Opportunity Grants (HPOG)** demonstration. The two program partners in Pathways to Healthcare improved existing PCC training programs and PCOS services, seeking to engage low-income adults in occupational training and aid their academic and career progress.

Pathways to Healthcare combined several key components:

- *Mapping 16* existing *occupational training programs into five "pathways"* helped students who might otherwise find the course catalog confusing understand how completing one credential can lead to a higher credential and higher paying job.
- *Intensive and proactive staff guidance and advising* helped students and program staff identify and address barriers to participating in the program, select a training program, persist in and complete the chosen program, and subsequently enter employment.
- *Scholarships* for tuition, books, and other supplies to reduce the cost of training.

[1] http://www.bls.gov/news.release/ecopro.nr0.htm.

- *Two compressed and contextualized basic skills ("bridge") programs* helped students with low levels of basic skills enroll directly in one of the 16 occupational programs.
- *Employment supports* helped program completers locate employment through coaching for job interviews and help with resume writing.

Pathways for Advancing Careers and Education (PACE) Evaluation

Abt Associates and its partners are evaluating Pathways to Healthcare as part of the **Pathways for Advancing Careers and Education (PACE)** evaluation. Funded by ACF, PACE is an evaluation of nine programs that include key features of a "career pathways framework."

The **career pathways framework** guides the development and operation of programs aiming to improve the occupational skills of low-income adults by increasing their entry into, persistence in, and completion of postsecondary training. These students are primarily older and nontraditional students. The framework describes strategies for overcoming barriers to education and training that these students can face. Key features of programs within this framework include:

- a series of well-defined training steps;
- promising instructional approaches targeted to adult learners;
- services to address academic and non-academic barriers to program enrollment and completion; and
- connections to employment.

The Pathways to Healthcare evaluation includes an **implementation study** that examines the design and operation of the program and enrolled students' participation patterns, and an **impact study** that used an experimental design to measure differences in educational and employment outcomes between individuals randomly assigned to a group that could receive Pathways to Healthcare (treatment group) and a group that could not (control group).[2] Using data from baseline surveys, a follow-up survey, program records, and site visits, this report provides the results from the implementation study and it describes the early impacts of the program (18 months after random assignment) on education, training and employment, including hours of college occupational training received since random assignment, the primary outcome to assess the early effects of Pathways to Healthcare.[3]

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[2] Random assignment ensures that the treatment and control groups will be alike in their observed and unobserved characteristics, and that any systematic differences in their outcomes can be attributed to the treatment group having access to program services.

[3] See the PACE analysis plan. Abt Associates, Inc. (2014). The Pathways to Healthcare analysis plan was also registered on the What Works Clearinghouse online registry of randomized control trials (RCT) on May 20, 2016 and the Open Science Framework site. In September of 2016, under the terms of a grant from the Institute of Educational Sciences, the RCT registry information was removed from the WWC website and transferred to the Society for Research on Educational Effectiveness (SREE). SREE plans to re-launch the registry in late 2017, at which time the analysis plan will be available in a searchable online database.

Key Findings

From the Implementation Study

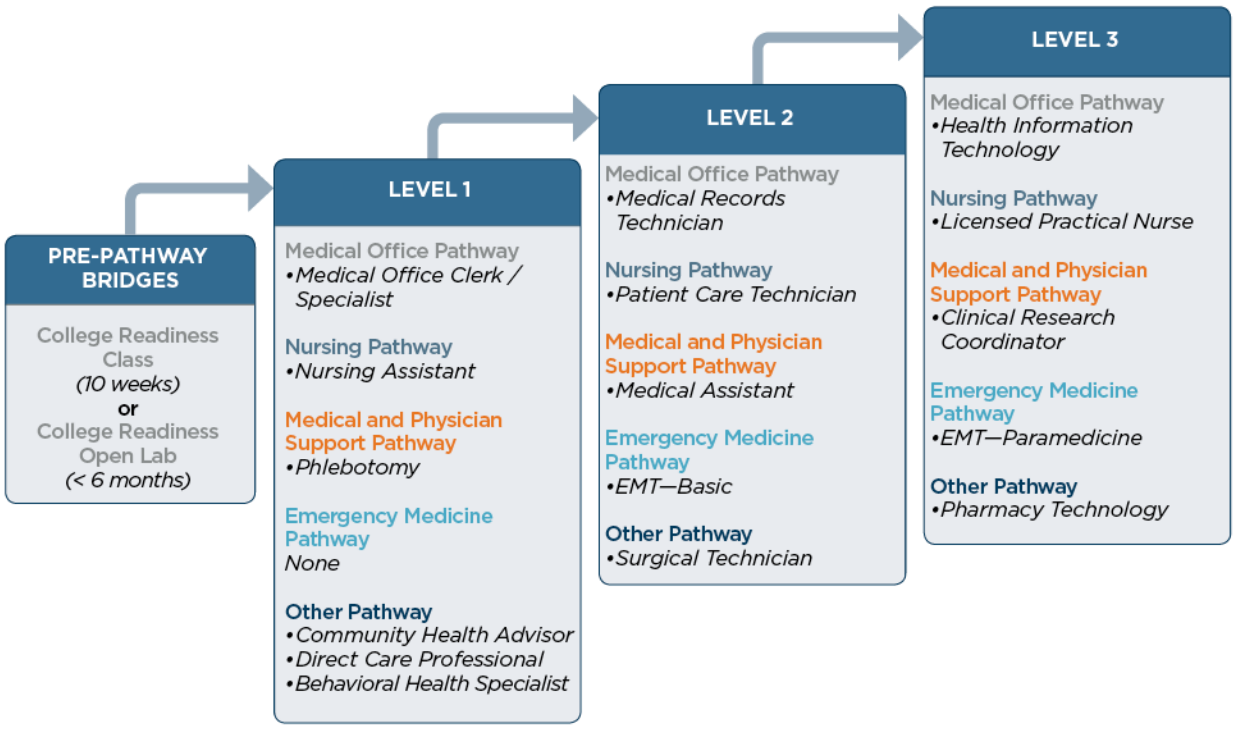
- ***Pathways to Healthcare mapped 16 of PCC's existing occupational training programs into five distinct pathways.***

By mapping individual training programs into defined career pathways, PCC leadership hoped to simplify enrollment and placement in the right program and focus students on longer-term training goals. As Exhibit ES-1 shows, Pathways to Healthcare designated each of the 16 training programs into one of five pathways: Medical Office, Nursing, Medical and Physician Support, Emergency Medicine, or Other. Within each pathway, they designated programs by "level" (1 for entry level, 2 for mid-level, and 3 for advanced level).

- ***The program successfully implemented two bridges to help participating students improve basic skills prior to enrollment in occupational training. Twenty-six percent of treatment group members participated in at least one bridge.***

As Exhibit ES-1 shows, Pathways to Healthcare implemented two versions of a bridge program for those students whose basic academic skills (i.e., math, reading, writing) were too low to enter an occupational program directly. The 10-week College Readiness class and the open lab were designed to help students quickly increase basic skills and score high enough on the required ACT Compass® assessment to begin their training of choice.

Exhibit ES-1. Pathways Overview



- ***Pathways to Healthcare developed and implemented instructional supports to help students persist in and complete their training programs.***

Instructors and PCC staff members noticed that some students had difficulty persisting in their programs and proposed a number of course-specific supports to help participants master content and learn college success skills. Two training programs, Pharmacy Technology and Nursing Assistant/Patient Care Technician, implemented weekly instructor-led study groups to help students bolster basic skills and learn occupational content. PCC also implemented the Pre-LPN Reading Group for students trying to achieve the Compass reading score (90 or above) necessary to qualify for the Licensed Practical Nurse program. The Nursing Assistant Readiness Class was implemented after staff determined that many Nursing Assistant students did not have the college success skills, such as time management, needed for the course.

- ***Pathways to Healthcare implemented three advising positions designed to identify and address barriers to enrollment, persistence, and completion.***

The three advisors—PCOS's Workforce Development Specialist (WDS) and PCC's Student Services Advanced Specialist (SSAS) and Student Services Specialist (SSS)—were expected to collaborate to address the range of potential academic and non-academic barriers that could affect a student's ability to enroll in and complete a training program.

In order to engage students quickly, the first advising meeting, with the WDS, was supposed to occur within two weeks of random assignment and focus on identifying barriers and necessary supports to overcome them. Within a week of this meeting, the student met with a SSAS to begin discussing pre-training activities at the college. According to a PCC staff member, these initial meetings were intended to help students not lose their way early in the Pathways to Healthcare program. The SSAS helped students navigate the steps to enrollment; once a student enrolled in a training program, the SSS provided guidance to help ensure completion.

- ***All Pathways to Healthcare students approved for occupational training received scholarships.***

Pathways to Healthcare provided scholarships to all participants with an approved Training Plan. During the study period, the per-student scholarship (for tuition and books) was roughly $3,500. Recipients who subsequently pursued a second course of study could receive additional funds, based on availability.[4]

- ***Pathways to Healthcare staff designed and implemented services to assist in the transition to employment.***

Program staff members observed that many students completing the program had difficulty transitioning from training to employment. Based on the recommendations of a workgroup, staff created new PCOS workshops to help students customize their job searches to the healthcare industry and provide guidance ranging from resume development to practice interviewing; implemented the

[4] In Year 2 of the program, there was a waitlist for scholarships due to PCC awaiting approval of Year 1 carryover funds and more Year 1 participants than expected, who were still in training in Year 2. As a result, some Year 2 treatment group members relied entirely on Pell grants and WIA funds.

New Employee Transition program to encourage employers to hire program graduates by funding training on the job to help them acclimate to the specific workplace[5]; and launched the Student and Alumni Network to help students and graduates develop a professional network, build a sense of community, and foster college success skills.

- ***Most treatment group members participated in Pathways to Healthcare's College Readiness program or its occupational training. Fewer transitioned from College Readiness to occupational training or from an initial training program to a higher-level one.***

As shown in Exhibit ES-2, 62 percent of all treatment group members participated in College Readiness or occupational training, with 35 percent enrolling directly in occupational training and 26 percent enrolling in the College Readiness class or open lab. Half of the latter (13 percent) enrolled in training after completing College Readiness.[6] Of the 48 (35 + 13) percent who enrolled in training, 29 percent (60 percent of trainees) received a credential and another nine percent (19 percent of trainees) were still in their first training at the end of the follow-up period. The remainder dropped out.

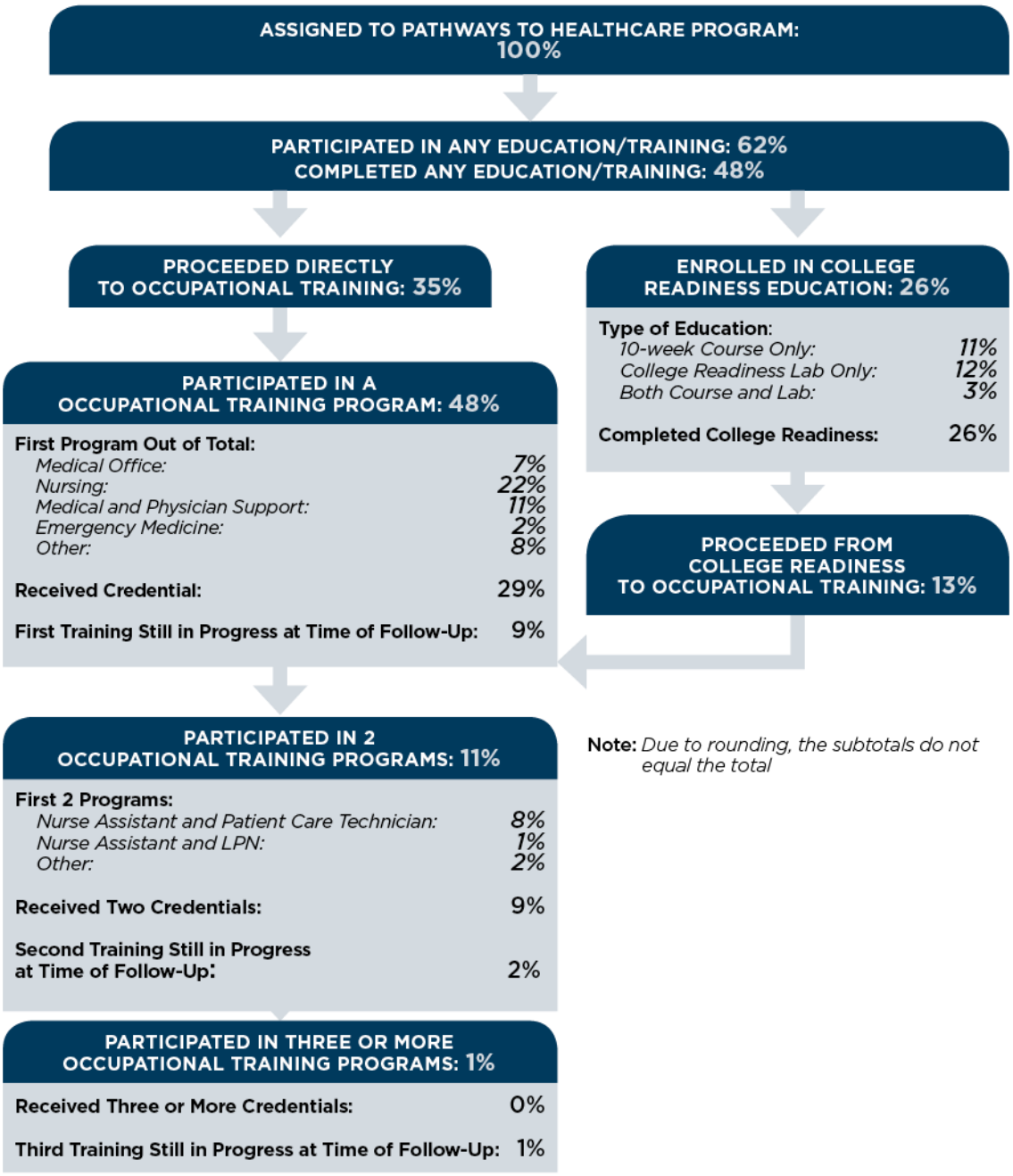
There are many potential reasons why only half of College Readiness completers enrolled in occupational training. Some who did not may have chosen not to take the Compass assessment required for occupational training or may not have passed it. Some may have decided to enroll in other types of training at PCC. Responses to the follow-up survey suggest that some students did not have enough time for work and family, or would not receive enough financial aid.

The exhibit also demonstrates that close to one-quarter of the 48 percent who enrolled in occupational training went on to attend a second training during the follow-up period. Most of these combined the Level 1 Nursing Assistant and the Level 2 Patient Care Technician programs. One likely reason more students had not progressed along their chosen pathway during the study period is that program staff encouraged training completers to work for six months in the occupation before returning for an additional credential. The Nursing Assistant/Patient Care Technician pairing was the only case in which students could enroll directly in a second program upon completion of the first.

[5] HPOG funds could be used for training but not wages.

[6] Due to rounding the figures do not add up to 62.

Exhibit ES-2. Participation in and Completion of Education and Training among Treatment Group Members within an 18-Month Follow-Up Period



SOURCE: Pima Community College records.

- ***A sizable subgroup of treatment group members did not enroll in College Readiness or occupational training.***

Thirty-eight percent of treatment group members attended neither College Readiness nor occupational training. There are a number of possible reasons. Responses to the follow-up survey suggest that some may have found it more difficult than they expected to juggle school with other commitments, particularly work. Similar to the group of participants who did not advance beyond College Readiness, for the subset of Pathways to Healthcare treatment group members who did not enroll in training at all, the most common reasons reported as very important to not enrolling were not enough time for work and for family and not enough financial aid. Also, as noted below, treatment group members had to wait an average of four months to start their programs which may have discouraged them from enrolling.

- ***Nursing was the most common pathway and Nursing Assistant was the most commonly attended and completed training program.***

As Exhibit ES-3 shows, of those who participated in education or occupational training, more than one-third (36 percent) were in the Nursing pathway; within this pathway, Nursing Assistant was the most common program (84 percent of those in the pathway and 30 percent of participants overall). The Nursing pathway completion rate was 82 percent, driven largely by the five-week Nursing Assistant program (88 percent) and four-week Patient Care Technician add-on (92 percent). The third program in the pathway, the 13-month Level 3 Licensed Practical Nurse program, had a lower completion rate (29 percent), but a large proportion of participants were still enrolled at the end of the follow-up period (54 percent, not shown).

The next most common pathway was Medical and Physician Support (18 percent of participants overall); within this pathway, the 15-month Medical Assistant program was the most common. Its completion rate (25 percent) was lower than for other programs in the pathway, notably Phlebotomy (80 percent), but the duration of the program was longer and more participants were still in training at the end of the follow-up period (not shown). This pathway had the largest proportion of participants still enrolled at the end of the follow-up period (44 percent).

Exhibit ES-3. Type of Program Attended, Completion Rates, and Average Length of Stay among Treatment Group Members in Pathways to Healthcare over 18-Month Follow-Up Period

Education and Training Program	Participation Rate	Of Participants in Specified Program		
		Completion Rate	Average Length of Stay (mos.)	Participating at End of Follow-Up
College Readiness	42.4%	99.4%	2.4	1.6%
Occupational Training	78.4%	59.9%	6.4	24.8%
College Readiness and Occupational Training	20.8%	47.4%	7.0	30.8%
Attended Any Training Program or College Readiness	100.0%	53.1%	6.0	19.5%
Occupational Training Programs				
Medical Office–Health Information Management Pathway	11.5%	51.2%	6.4	14.0%
Medical Office (Level 1)	5.9%	63.6%		
Medical Records Technician (Level 2)	3.2%	66.7%		
Health Information Technology (Level 3)	2.4%	0.0%		
Nursing Pathway	35.7%	82.1%	3.2	15.7%
Nursing Assistant (Level 1)	29.9%	87.5%		
Patient Care Technician (Level 2)	16.0%	91.7%		
Licensed Practical Nurse (Level 3)	7.5%	28.6%		
Medical and Physician Support Pathway	17.6%	40.9%	10.5	43.9%
Phlebotomy (Level 1)	4.0%	80.0%		
Medical Assistant (Level 2)	11.7%	25.0%		
Clinical Research Coordinator (Level 3)	1.9%	28.6%		
Emergency Medicine Pathway	2.9%	45.5%	5.6	18.2%
EMT–Basic (Level 2)	2.9%	45.5%		
EMT–Paramedicine (Level 3)	0.0%	–		
Other Pathway	12.8%	41.7%	8.9	31.3%
Community Health Advisor (Level 1)	0.5%	50.0%		
Direct Care Professional (Level 1)	0.0%	–		
Behavioral Health Specialist (Level 1)	5.3%	55.0%		
Surgical Technician (Level 2)	1.3%	40.0%		
Pharmacy Technology (Level 3)	4.8%	16.7%		

SOURCE: PCC records.

NOTES: Sample size is 375 and includes all students who participated in at least one Pathways to Healthcare training program. Completion rate and length of stay are calculated for those who attended the specified program. Individual items may not sum to totals because students can attend more than one training.

- ***While the average length of stay in a training program was six months, an average of almost 11 months elapsed between enrollment in Pathways to Healthcare and completion of training.***

Some 60 percent of those who participated in occupational training completed their program in an average of six months, and 25 percent were still in their training program at the end of the follow-up period (see Exhibit ES-3). However, the average time between random assignment (enrollment in Pathways to Healthcare) and last date of participation was 11 months, with more than 45 percent of students attending a year or longer. A key factor in this total length of stay in the Pathways to Healthcare program is the amount of time students spent between enrollment and the start of training. Students averaged almost four months before starting their training, with one-third waiting longer than

four months. Several factors likely contributed to the delay in training enrollment, including getting a Training Plan approved, completing pre-enrollment activities, and waiting for the training start date.

- ***The treatment group was significantly more likely than the control group to participate in education and training.***

All 1,217 study participants (treatment and control group) could enroll in PCC's training programs and receive services from PCC and PCOS, but only treatment group members could access the additional components that comprised the Pathways to Healthcare program. Students in the treatment group were significantly more likely to participate in training than members of the control group. This held true both for training in any subject (60 percent of the treatment group versus 47 percent of the control group) and for healthcare-related training (37 percent versus 30 percent). Treatment group members were significantly more likely to participate in basic skills instruction than were control group members (18 percent versus 10 percent), with the College Readiness class and lab likely accounting for the difference.

- ***The treatment group was significantly more likely than the control group to participate in advising and employment services; a minority of both groups reported they used the services, however.***

Treatment group members were significantly more likely than control group members to receive career counseling (28 percent versus 19 percent) or help arranging supports (14 percent versus 7 percent). Those in the treatment group also were significantly more likely to receive job search assistance than were control group members (23 percent versus 14 percent). Significantly fewer treatment group students (58 percent) cited financial support as a challenge to enrollment or persistence in the program than did control group members (69 percent).

From the Impact Study

- ***The Pathways to Healthcare program increased the total hours of college occupational training that students received. Since this is the primary outcome for the early analysis of this program, the finding indicates that the program was on track toward achieving its main goals.***

As Exhibit ES-4 shows, Pathways to Healthcare had a statistically significant impact on the primary outcome of interest for this analysis period: hours of occupationally focused college training. The program had a 63-hour impact on total hours of training (over the 18-month follow-up period, 190 hours for the treatment group compared with 127 hours for the control group), a finding statistically significant at the 1-percent level.

Exhibit ES-4. Early Impacts on Educational Attainment (18 Months after Random Assignment)

Outcome	Treatment Group	Control Group	Difference		Standard Error	p-Value
Primary Outcome						
Total hours of college occupational training (average)	190.1	127.0	+63.1	***	15.2	<.001
Secondary Outcomes						
Enrollment in college occupational training in successive months after random assignment (%)						
Months 1-6	37.3	27.3	+10.0	***	2.6	<.001
Months 7-12	45.4	28.0	+17.5	***	2.6	<.001
Months 13-18	39.6	24.5	+15.1	***	2.6	<.001
Any month	55.8	36.0	+19.7	***	2.7	<.001
Total hours of college occupational training in successive months after random assignment (average)						
Months 1-6	56.4	49.1	+7.2		7.2	.156
Months 7-12	72.3	40.2	+32.1	***	6.2	<.001
Months 13-18	61.4	37.6	+23.8	***	6.4	<.001
All months	190.1	127.0	+63.1	***	15.2	<.001
Total hours of occupational training at (average)						
A college	190.1	127.0	+63.1	***	15.2	<.001
Another place	17.5	32.7	-15.2		8.2	.968
Any place	210.3	159.2	+51.1	***	17.6	.002
Total credits earned from colleges by 18 months	1.5	1.7	-0.2		0.3	.799
Received a credential from (%)						
A college	23.1	10.4	+12.7	***	2.1	<.001
Another education-training institution	2.1	9.0	-6.8		1.6	1.000
A licensing/certification body	24.1	22.5	+1.6		2.7	.282
Any source	34.6	29.4	+5.2	**	2.9	.040
Sample size[a]	609	608				

Covariate procedure used for these tables: Residualization.
SOURCE: Abt Associates calculations based on data from Pima college records and the PACE short-term follow-up survey.
NOTES: Statistical significance levels, based on one-tailed t-tests of differences between research groups, are summarized as follows: ***statistically significant at the one percent level; ** at the five percent level; * at the ten percent level.
[a] Sample sizes in this row apply to estimates based on college records for the full sample. In the last two panels (total hours and credentials by place), estimates for activity at a college are based on college records for the full sample, while all other estimates (including those for activity at any source) are based on the subsample who responded to the PACE follow-up survey, including 500 treatment and 477 control group members.

This impact on participation in occupational training is the result of the Pathways to Healthcare program enrolling more students in the treatment group (20 percentage points) in training compared to the control group, rather than increasing the hours of participation among those who otherwise would have enrolled. From this perspective, the average effect of an increase of 63 hours across the entire treatment group translates into roughly a 320 hour increase for the approximately 20 percent of treatment group members who in the absence of Pathways to Healthcare would not have enrolled in occupational training.

There were also impacts on a number of training-related secondary outcomes, including enrollment in and total hours of occupational training in successive months after random assignment and receipt of a credential from a college. The second and third panels in Exhibit ES-4 show that both fractions of students enrolled and average total hours of college occupational training received are higher for

treatment group members than for control group members in each of the three six-month follow-up intervals after random assignment. Impacts on enrollment are smaller in the first six-month period (10 percentage-point difference), grow in the next six months (18 percentage-point difference), and remain positive in the last six months (15 percentage point difference). Impacts on average total hours follow a similar pattern. The bottom panel shows that treatment group members were also significantly more likely than control group members to obtain a credential from a college (23 percent versus 10 percent) and from any source (35 percent versus 29 percent).

- ***Pathways to Healthcare had a limited effect on employment-related outcomes 18 months after random assignment.***

The evaluation team also investigated the impact of program participation on two dimensions of career progress. Self-assessed progress towards career goals included measures of perceived career progress, confidence in career knowledge, and access to career supports. The analyses found positive impacts for these measures, with the largest effect on perceived career progress. At this point in time, there is no evidence of impact on employment outcomes, indicated by working in a job that pays at least $12 per hour, requires at least mid-level skills, or is in a healthcare occupation.

It is not surprising that the effects for self-assessed career progress are more positive than for actual employment outcomes after 18 months. The treatment group's greater progress in training compared with the control group's might well increase their sense of career knowledge and prospects. However, more treatment than control group members were still enrolled in training at the end of the 18-month follow-up period, suggesting it may be too early to expect positive effects on career-path jobs.

Next Steps in the Pathways to Healthcare Evaluation

This report on Pathways to Healthcare focuses on the implementation of the program and its early effects on participating students' education and training. At 18 months after students were randomly assigned into the program or not, the key program goal examined was increased occupational training, with limited analysis of employment and earnings. This reflects expectations that many students participating in the program would still be engaged in training at the end of 18 months.

The next Pathways to Healthcare report will cover a **36-month follow-up period**. It will take a more systematic look at program effects on students' economic outcomes for a period when these are expected to occur. The report will examine **employment outcomes**, such as average rate of employment and average earnings over successive follow-up quarters, and **job characteristics**, such as occupation, hourly wage, receipt of benefits, and career progress. Thus, it will begin to answer whether the occupational training gains that Pathways to Healthcare achieved after 18 months will translate into economic gains in the workplace in the longer term. An analysis at 72 months after random assignment will estimate long-term effects of the program.

1. Introduction

The federal government projects that over the next decade, the fastest-growing occupations are in healthcare (Bureau of Labor Statistics 2015). Successfully meeting the need for more healthcare workers is important both to the national economy and to the provision of quality healthcare to the population. This demand also creates opportunities for low-income adults to gain entry-level employment, as well as advancement to higher-skilled jobs. How to facilitate the match between the nation's need for a skilled workforce and low-income adults' need for employment is a topic of great interest to policymakers, workforce development organizations, educators, and other key stakeholders.

This report provides early evidence on the implementation and impacts of one promising effort to meet both needs, operated through a partnership between a local workforce agency and a community college. The evaluation of the Pathways to Healthcare program is a key contribution to understanding the effects of a strategy that combines occupational mapping and assistance navigating career pathways with educational, financial, and employment supports.

Almost all jobs in healthcare require some level of postsecondary education or training. This requirement can range from modest (weeks) to substantial (multi-year) for higher-skilled jobs. Research indicates many low-income, low-skilled adults face considerable barriers to completing even short-term training for entry-level jobs. Many are "nontraditional" students—that is, older, often parents, lacking adequate basic academic skills, and with few economic resources (NCES 2016). Often they enroll in college to obtain occupational certifications rather than academic degrees.

Research further shows that on average, nontraditional students fare poorly in postsecondary settings (Visher et al. 2008, Cooper 2010, Goldrick-Rab and Sorenson 2010). Institutions often assign students who need to improve their basic academic skills to developmental (remedial) education; many of these students never progress beyond it. Others drop out due to financial setbacks or difficulties juggling school, work, and family responsibilities. Some have difficulties navigating the college environment, including course sequences and financial aid. Many have difficulty meeting academic standards (Bridges to Opportunity Initiative 2008). Although research has documented these barriers to success, it provides less evidence about how to overcome them.

To increase knowledge about how to improve postsecondary outcomes for such a population, the **Health Profession Opportunity Grants (HPOG)** demonstration provided low-income individuals with opportunities for education, training, and career advancement in healthcare occupations to address workforce needs.[7] State, local, and tribal organizations such as community colleges and workforce agencies were eligible to receive these grants. Grantees could use funds to provide financial assistance, case management, and other support services to recipients of cash assistance through the Temporary Assistance for Needy Families (TANF) program as well to other low-income adults, in conjunction with training them for healthcare jobs in demand in the local economy. The Administration for Children and Families (ACF) in the U.S. Department of Health and Human Services (HHS) administers the HPOG program.

[7] HPOG was authorized by the Affordable Care Act.

In 2010, ACF awarded **Pima Community College (PCC)** of Tucson, Arizona, and its partner **Pima County One Stop (PCOS)** a 5-year, $18-million HPOG grant to launch and operate the **Pathways to Healthcare** program.[8]

Before being awarded its HPOG grant, PCC already offered training in multiple healthcare occupations. For the Pathways to Healthcare program, PCC and PCOS partnered to test a collaborative approach to helping low-income adults access and complete training in the growing healthcare sector. The collaboration deepened an existing PCC/PCOS partnership designed to improve coordination of services. With the HPOG grant, the partners sought to engage low-income adults in college and facilitate their academic and career progress by augmenting PCC's existing training programs and PCOS services with the following five components[9]:

- *Mapping of 16 of PCC's occupational training programs* into five "pathways" and identifying a "ladder" of programs within each pathway in order to clarify for students, who might otherwise find the course catalog confusing, how completion of one certification can lead to a next-higher credential (and a higher-paying job).[10]
- Providing *more-intensive and proactive staff guidance and advising* to identify and resolve barriers to program participation, aid participants in selecting a training program, help them to persist in and complete the chosen program, and subsequently enter employment.
- Providing *scholarships* for tuition, books, and other program supplies, to reduce the cost of obtaining a certificate or degree.
- Adding *two compressed and contextualized basic skills ("bridge") programs*—a 10-week class and an open lab. These College Readiness bridges were for students whose low level of basic skills prevented them from enrolling directly in one of the 16 occupational programs.
- Providing *supports, including resume preparation, coaching for interviews and other forms of job search assistance to help program completers locate employment,* most of which staff developed in the later years of the program.

In Pathways to Healthcare, students can take multiple steps on a career pathway; for example, enrolling in a training course and receiving advising and employment services, working for a period of time, then returning for a second training course in the pathway.

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8 PCC received an extension on its original 2010 grant beyond the five years (to March 2016). In 2015, PCC received a new five-year HPOG grant for a modified version of Pathways to Healthcare.

9 Pathways to Healthcare also added the following, less-central components: assessment of all applicants using the skills and aptitudes assessment Test for Adult Basic Education (TABE) and funding of a staff member to teach an evening Nursing Assistant course.

10 One of the 16 programs had not existed previously, but was added at the outset of Pathways to Healthcare and so was included in the programs mapped. Like the other 15, it was open to all PCC students.

Abt Associates and its partners are evaluating Pathways to Healthcare as part of the **Pathways for Advancing Careers and Education (PACE) evaluation**.[11] The evaluation of the Pathways to Healthcare program includes both an implementation study to examine its design and operation and an impact study that relies on a random assignment research design to estimate the impacts of access to Pathways to Healthcare on its students' education and training, employment, and other outcomes.

This report describes Pathways to Healthcare implementation and early impact findings on participant outcomes within an approximately 18-month follow-up period.[12] This chapter describes the PACE evaluation, summarizes findings from the research literature regarding the program components that Pathways to Healthcare added to PCC's and PCOS's existing services, and provides a roadmap to the rest of the report.

1.1. Pathways for Advancing Careers and Education (PACE) Evaluation

Funded by ACF, the PACE evaluation is a 10-year study of nine programs that include key features of a "career pathways framework." Initiated in 2007, PACE represents the first large-scale, multi-site experimental evaluation of career pathways programs.

Programs in PACE

- Bridge to Employment in the Health Care Industry at San Diego Workforce Partnership, San Diego, CA
- Carreras en Salud at Instituto del Progreso Latino, Chicago, IL
- Health Careers for All at Workforce Development Council of Seattle-King County, Seattle, WA
- Pathways to Healthcare at Pima Community College, Tucson, AZ
- Patient Care Pathways Program at Madison College, Madison, WI
- Valley Initiative for Development and Advancement (VIDA), Lower Rio Grande Valley, TX
- Washington Integrated Basic Education and Skills Training (I-BEST) program at three colleges (Bellingham Technical College, Whatcom Community College and Everett Community College), Washington State
- Workforce Training Academy Connect at Des Moines Area Community College, Des Moines, IA
- Year Up (Atlanta, Bay Area, Boston, Chicago, National Capital Region, New York City, Providence, Seattle)

The career pathways framework guides the development and operation of programs that aim to improve the occupational skills of low-income individuals, primarily older nontraditional students, by increasing their entry into, persistence in, and completion of postsecondary training. Central to accomplishing these improved outcomes, the framework articulates signature strategies for overcoming the barriers that nontraditional, occupational students often face. For example, key features of programs within this career pathways framework include having a series of well-defined training steps, promising instructional approaches, supportive services, and connections to employment (Fein 2012).

Programs consistent with the career pathways framework typically have multiple components, as illustrated by the HPOG-funded enhancements made by PCC/PCOS to existing services to create Pathways to Healthcare. The multi-component nature of such programs reflects the observation that nontraditional students face multiple barriers to success and that addressing only a single one is unlikely

[11] For more information on the PACE study, go to: www.acf.hhs.gov/opre/research/project/pathways-for-advancing-careers-and-education.

[12] The time frame was selected because the average completion of the 15-month follow-up survey occurred 18-19 months post random assignment.

to substantially improve their employment or other prospects. The career pathways framework is flexible, however, and not a specific program model. Thus, which components a local program adopts and how it implements them can vary greatly.

Reflecting this diversity, each of the nine programs in the PACE evaluation represents a different program model. All share some program components that are part of the career pathways framework, but each also has distinct and unique elements, reflecting the target populations, occupational trainings offered, and industries of focus. Because of this variation, PACE evaluates and reports findings for each evaluated program individually.[13]

The central goal of the PACE evaluation is to determine the effectiveness of each of the nine programs using a common evaluation design and conceptual framework (**impact study**). The most critical element of the evaluation design is **random assignment** of eligible applicants either to a **treatment group** that can access the career pathways treatment or to a **control group** that cannot. Random assignment ensures that the study's treatment and control groups will be equivalent in their observed and unobserved characteristics, and that any systematic differences in their subsequent outcomes can be attributed to the treatment group having access to program services (i.e., the program's impacts). Systematic differences in outcomes due to the characteristics of individual members in each group can be ruled out.

Consistent with this career pathways framework and the career pathways theory of change (described in Chapter 2) guiding the PACE evaluation, the key outcomes for which the PACE study estimates effects are in the **education and training and employment areas**, although the study also estimates effects in other areas, such as family well-being.

The PACE implementation and early impact program reports analyze outcomes over approximately **18 months following random assignment**. The impact analyses rely primarily on **surveys and college records** for individuals in the treatment group and control group. Future reports developed for different studies will analyze outcomes three years and six years after random assignment.[14] These latter two sets of reports will also include benefit-cost studies for some of the nine PACE programs.

As a condition of receiving HPOG funds, ACF required that grantees participate in any ACF-sponsored evaluation if selected to do so. In addition, ACF included additional evaluation funding to PACE to include at least three HPOG grantee programs in the evaluation. ACF and the research team selected Pathways to Healthcare as one of these three because the program planned to use its HPOG grant to implement promising features of the career pathways framework, and it was of sufficient scale to generate a research sample large enough to support a standalone impact study.[15]

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[13] All PACE related reports can be found on www.career-pathways.org as well as www.acf.hhs.gov/opre/research/project/pathways-for-advancing-careers-and-education.

[14] These reports will be part of the Career Pathways Intermediate Outcomes and Career Pathways Long-term Outcomes projects, respectively.

[15] The criterion for "promising" included positive empirical evidence of effectiveness for key components of the program or systematic, well-developed approaches to overcoming identified barriers to student success.

1.2. Key Enhancements of the Pathways to Healthcare Program

As noted earlier, to create Pathways to Healthcare, PCC and PCOS planned to add five components that research suggests are promising. Because of the limited available research on the impacts of career pathways programs, much of the research cited is on younger, low-income students in general education, as opposed to adults in occupational training programs. Still, because older, occupational career pathways students face many of the same barriers, much of the general education research is relevant to assessing the promise of Pathways to Healthcare for improving its students' postsecondary education and training outcomes.

Sequenced Training Steps. By mapping the 16 occupational training programs into five pathways, PCC administrators designed the Pathways to Healthcare program to be easier for advisors to explain and for program participants to understand how they could advance from one level and its associated credential to the next. There is evidence that traditional community college students can have difficulty navigating courses to efficiently obtain high-valued credentials; for example, some students experience problems identifying the correct course sequence from a catalog (Jenkins and Cho 2012; Scott-Clayton 2011). The designers of Pathways to Healthcare sought to address similar problems that made it difficult for its participants to have a clear vision of how to advance.

Advising. Pathways to Healthcare also augmented generic advisors with three more specialized positions to focus on academic and nonacademic issues. The advising feature was designed to address the common experience that college advisors often have very high student-to-advisor ratios, leaving little time for individual counseling (Grubb 2001). Several rigorous studies have demonstrated that augmenting existing advising services with more-intensive advising, sometimes combined with other services, can lead to greater persistence in education, although sometimes only for the short term (Bettinger and Baker 2011; Scrivener and Weiss 2009).

Financial Assistance. To further support its participants in training, Pathways to Healthcare provided financial support beyond what was typically available at PCC, in the form of scholarships that could be used for tuition, books, and other school-related costs. A large body of evidence indicates that insufficient resources are a barrier to entry and completion of education and training for low-income students and that financial assistance can increase postsecondary attendance and persistence (Deming and Dynarski 2010; Dynarski and Scott-Clayton 2013).

Improving Basic Skills. Pathways to Healthcare also encouraged participation of individuals whose basic skills were too low to enter occupational training directly. In the absence of Pathways to Healthcare, they would need to enroll in and complete appropriate courses in PCC's developmental education sequence in order to enroll in its college-level courses. Evidence indicates that most students referred to developmental education never enroll in college-level courses (Bailey, Jeong, and Cho 2010). To help overcome this barrier, Pathways to Healthcare offered such individuals two short-term bridge programs. In addition, Pathways to Healthcare contextualized these basic skills bridges by integrating healthcare content into them. There is some evidence that compressing developmental education into shorter periods can improve outcomes for low-skilled students, but no rigorous evidence of its effectiveness (Rutschow and Schneider 2011). The evidence for the effectiveness of contextualization is also weak (Perin 2013).

Employment Assistance. Over the duration of the program, Pathways to Healthcare developed three workshops and several other activities to help individuals who completed training to locate employment. The workshops included a number of different activities, such as coaching on effective job interviewing, resume preparation and other forms of assistance to better promote employment for participants completing training. Research on the effectiveness of such assistance is mixed with some studies showing positive employment effects but others not (Klerman et al. 2012).

1.3. Structure of This Report

The organization of the remainder of this report is:

- Chapter 2 presents the Pathways to Healthcare evaluation's conceptual framework and research questions; details the evaluation design; describes the study sample; and summarizes the evaluation's data sources.
- Chapter 3 describes the Pathways to Healthcare program's context and administrative structure.
- Chapter 4 describes the implementation study findings, including training programs and instructional approaches, participation in training and comparisons of participation in education and training across the treatment and control groups, academic and nonacademic advising, employment supports, and financial assistance provided by the program.
- Chapter 5 presents the impact study findings, focusing on two main impacts—hours of training, and credentials received over an 18-month follow-up period—as well as a series of other career and life outcomes.
- Chapter 6 summarizes the implementation and impact findings and discusses their implications for the longer-term study.

The appendices provide additional details about the programs in the Pathways to Healthcare program (Appendix A); baseline data (Appendix B); college records data, a key source for the impact study Appendix C); survey-based outcomes (Appendix D); and the approach to outliers (Appendix E).

2. PACE Evaluation Design and Data Sources

This chapter describes the larger PACE evaluation design and its application to Pathways to Healthcare. It begins with a discussion of the PACE career pathways theory of change and the research questions that the theory of change implies. It then briefly describes the evaluation design and analysis procedures for the impact study, including the random assignment process and the outcome of that process. A brief description of the implementation study analysis follows.[16] Finally, the chapter summarizes the main data sources for the implementation and impact studies.

2.1. Career Pathways Theory of Change

The career pathways theory of change guides both the implementation study (that is, it identifies which aspects of program services are expected to affect outcomes) and the impact study (that is, it identifies which outcomes the program is expected to affect). The theory of change also generates key hypotheses about the direction of expected effects that the impact evaluation will test for statistically significant change.[17] In addition, the theory of change implicitly assumes time horizons by which the program is expected to have effects, and thus the theory determines the key outcomes at any particular time of follow-up.

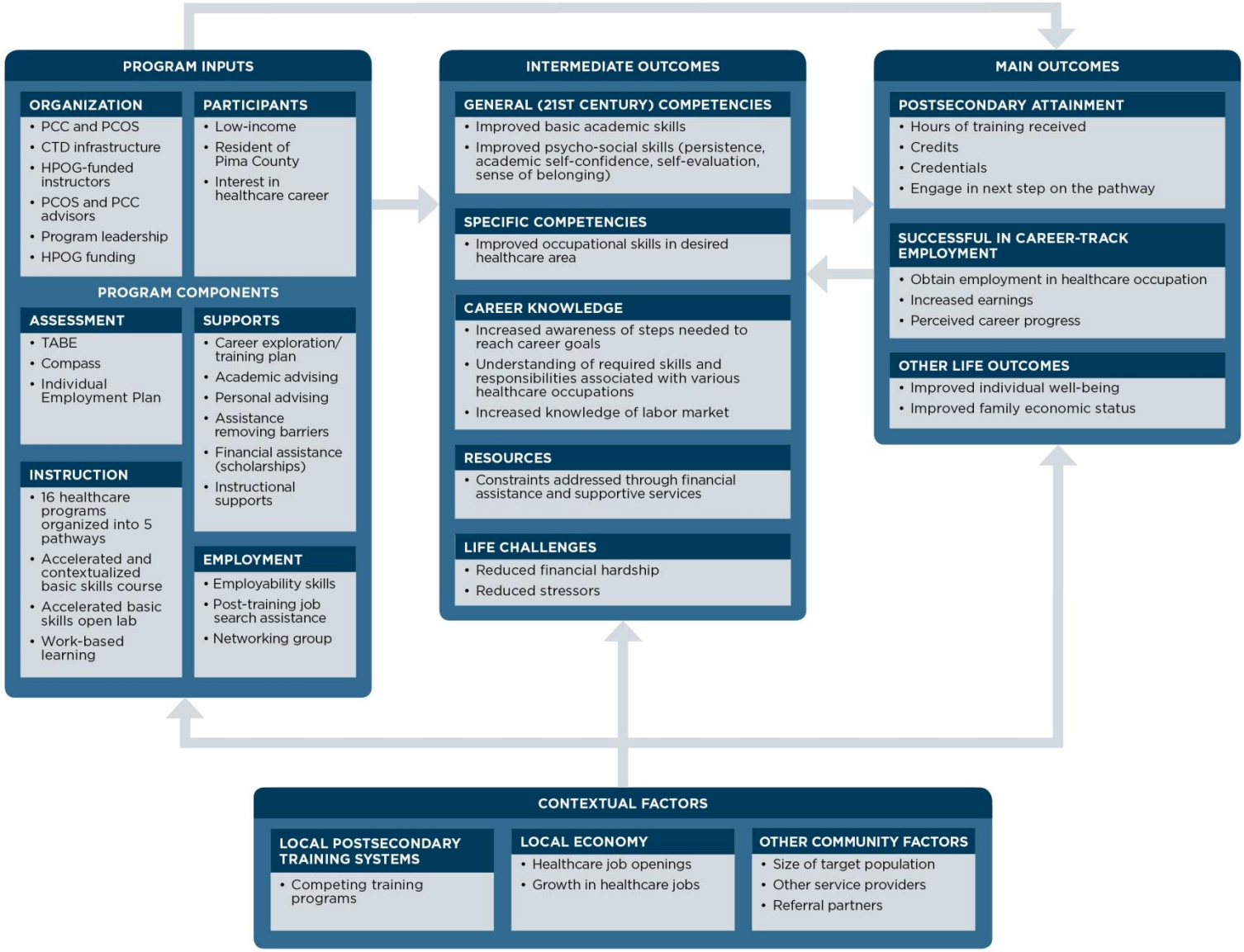
Exhibit 2-1 depicts the PACE career pathways theory of change, as applied to Pathways to Healthcare.[18] It shows how a program (inputs) is hypothesized to produce effects on intermediate outcomes, which in turn will lead to effects on main outcomes. Effects on intermediate outcomes are expected earlier than effects on main outcomes, but the exact timing depends on particular features of the program, such as the length of occupational training and what, if any, steps precede it. In addition, because effects on intermediate outcomes may persist over time, the study will also measure them at later points in time.

[16] The research team developed a detailed evaluation design report for the PACE evaluation, including the evaluation of Pathways to Healthcare (Abt Associates, Inc. 2014).

[17] The implementation study describes the set of services that students in the treatment group experienced. In addition to descriptive statistics, it includes a small number of impact estimates that show the difference in services received between treatment and control group members. The impact study focuses solely on estimates of the effects of the program on intermediate and main outcomes.

[18] See Fein (2012) for an extended description of the framework.

Exhibit 2-1. Career Pathways Theory of Change



As shown in Exhibit 2-1, starting in the box at the left, the career pathways theory of change begins with two types of program inputs[19]:

- **Organization.** Organizational inputs include the lead agencies (PCC and PCOS, in the case of Pathways to Healthcare), funding (HPOG), staff (HPOG-funded instructors, advisors), physical resources (PCC's Center for Training and Development (CTD), which housed most of the occupational training programs), and the management structure.
- **Participants.** This individual input includes the characteristics of the target population (being a low-income resident of Pima County and having an interest in a healthcare career, in the case of Pathways to Healthcare).

This same box includes four kinds of program components that are expected to improve participant outcomes by overcoming specific barriers that are hypothesized to impede successful entry into and completion of occupational training:

- **Assessment.** Pathways to Healthcare used the TABE to determine whether a participant would be required to participate in one of the bridge programs designed to improve basic skills.
- **Instruction.** For Pathways to Healthcare, these comprise the five pathways of 16 programs and the two bridge programs. Importantly, control group members could access the same 16 occupational training courses that treatment group members could, so any of the particular features of these courses do not differentiate the experiences of the two groups.
- **Supports.** For Pathways to Healthcare, these were career and academic advising, advising on personal issues, and financial assistance in the form of scholarships.
- **Employment.** For Pathways to Healthcare, these employment connections included workshops and networking opportunities for the study's treatment group members.

The middle box shows the intermediate outcomes, where improvements are expected to lead to better main outcomes. These intermediate outcomes include improved basic skills for participants who need remediation and improved psycho-social skills such as grit and academic self-confidence; attainment of occupational-specific skills for those who enroll in one of the five healthcare pathways; career knowledge and college success skills; and reduced financial hardship.

In the far right box, the main outcomes are the primary targets that programs seek to change. These include:

- Increased postsecondary attainment, namely accumulated hours and credits (as measures of progress toward a credential), occupational training credentials, and engagement in the next step of the pathway.

[19] Program inputs can include both components available only to treatment group members as well as those available to both treatment and control group members, because the interaction of the former components with the latter can lead to impacts.

- Successful employment, including obtaining employment in the healthcare industry, increasing earnings and job benefits, and career advancement.
- Improvements in other outcomes such as individual well-being.

Influencing expected effects are a number of contextual factors including the types and number of postsecondary training systems in the local area, the local economy (in particular healthcare jobs), and other community factors such as the size and characteristics of the target population, and the number and nature of service providers.

2.2. Research Questions for Evaluation of Pathways to Healthcare

The implementation study documented Pathways to Healthcare as implemented and captured participation patterns of treatment group members in training and other activities (see Chapter 4 for implementation findings). The impact study (see Chapter 5) aimed to measure the effectiveness of Pathways to Healthcare in improving students' intermediate and main outcomes.

Implementation study research questions:

- What is the intended program model? What is its institutional and community context?
- What intervention was actually implemented? Did it deviate from plans or expectations?
- What were the treatment group's participation patterns and experiences with program services?
- What are the differences in services, including training, received by treatment and control group members?

Impact evaluation research questions:

- What were the main effects of Pathways to Healthcare on:
  - Educational attainment, including hours of occupational training received, credits received, credentials received, and other educational outcomes?
  - Entry into career-track employment, higher-wage jobs, earnings, and perceptions of career progress?
  - Participant and family well-being, including income and material hardship?
- To what degree did the program affect intermediate outcomes in the theory of change, such as:
  - Confidence in career knowledge and access to career supports?
  - Psycho-social skills such as grit, academic self-confidence, core self-evaluation, and social belonging at school?
  - Life stressors, such as financial hardship, life challenges, and perceived stress?

As mentioned, the program's theory of change not only describes hypothesized causal connections, it also identifies time horizons over which they are expected to occur. For example, with respect to Pathways to Healthcare, individuals whose first step is the bridge programs will require up to one

semester to complete it successfully and then, most often after some period of time, to enter the next available occupational training course. Given that some courses of study are longer than others and there is some time between them, it is likely that some students will still be in their first training program at the end of the 18-month period. Thus, this early impact report focuses primarily on training outcomes that do not require a participant to complete a program and earn a credential.

For this report, the primary data sources for addressing the impact research questions are PCC records, two surveys administered at "baseline" (study intake), a follow-up survey of treatment and control group members initiated at approximately 15 months following random assignment, and the HPOG management information system. The implementation study questions use information gathered during site visits and monitoring calls. A more complete description of data sources is in the concluding section of this chapter.

Later PACE reports will focus more on employment outcomes and on education and training outcomes resulting from activities that require a longer time to complete (e.g., Associate's degree programs). In addition, continued measurement of such outcomes will be important, given that the career pathways framework implies that workers may alternate education and training and employment as they move along a pathway.

2.3. PACE Evaluation Design and Analysis

As mentioned in Chapter 1, the PACE evaluation uses a random assignment research design to estimate the impact of access to the program on students' outcomes. The great benefit of such a design is that when properly implemented, it ensures that estimated effects reliably can be attributed to access to the program and not to unmeasured differences in characteristics or external circumstances between individual students with access (treatment group) and without access (control group) to the program.

However, maintaining the comparability of the treatment and control groups requires comparing all of those in the treatment group with all of those in the control group, regardless of whether or not treatment or control group participants actually enrolled in the program (what researchers refer to as an "intent to treat" analysis). A critical implication of this is that the evaluation estimates the impact of *access* to the entire program—to the entire Pathways to Healthcare program, in this case—as opposed to the impact of the program's specific components. The evaluation does so by comparing the entire control group with the entire treatment group with access to Pathways to Healthcare, regardless of the treatment group's actual take-up of any particular program component or any component at all.

A second feature of the impact study design is that both treatment and control group members can access education, training, and support services available in the community that are not exclusive to the program PACE is evaluating. In the case of Pathways to Healthcare, the evaluation estimates the effect of the program's components above-and-beyond what was otherwise available at PCC, PCOS, and elsewhere in the community during the study period. For example, both treatment and control group members could access the same PCC occupational training courses. Thus, the control group's experiences represent what would have happened absent Pathways to Healthcare's additional, enhanced components, such as mapping and navigation supports for the 16 occupational training programs, three special advisors, and scholarships.

In summary, the impact study assessed whether the existence of this multi-component career pathways program led to better outcomes for students who were offered the chance to participate, given what these students could have obtained without the program.[20]

2.3.1. Intake and Random Assignment Procedures

The research team worked closely with each program in the PACE evaluation to design and implement program intake and random assignment procedures. The steps in the procedures for Pathways to Healthcare were:

Recruitment. Interested individuals first attended an information session at either PCOS or PCC, where they received a one-page information sheet describing PCC's 16 occupational training programs and the associated average wages. Staff members also described Pathways to Healthcare's services, its eligibility requirements, and how random assignment governed admission to it. Before they left the information session, attendees interested in applying scheduled an appointment at PCOS to have their eligibility determined.

- **Eligibility.** At PCOS, applicants took the TABE, which determined where they would start on their pathway of interest, followed by a determination by staff of their income and residence eligibility. Eligible applicants proceeded to an intake appointment at PCC.
- **Informed Consent.** At the intake appointment, PCC staff discussed the PACE evaluation and offered its informed consent form. Applicants who refused to sign the informed consent form were not included in the study and were not eligible for Pathways to Healthcare services. Those who signed the form became study participants.
- **Baseline Data.** Study participants completed the Basic Information Form (BIF) and the Self-Administered Questionnaire (SAQ). The BIF collected demographic and economic information. The SAQ measured a variety of attitudes, beliefs, and psycho-social dispositions, as well as more sensitive personal characteristics.
- **Random Assignment.** Program staff used an online system to randomly assign study participants to the treatment group or control group. The random assignment ratio was 1:1, so that the treatment and control groups would each include approximately half of the research sample.
- **Services According to Random Assignment Status.** Study participants assigned to the study's treatment group had access to Pathways to Healthcare services (but were not required to use them). Those assigned to the control group were not able to access the Pathways to Healthcare

[20] Four technical appendices provide additional details about analysis methods. Appendix B describes data collected at baseline, gives further detail on baseline characteristics of treatment and control group members, and explains procedures for using these data to adjust for imbalances arising by chance during random assignment. Appendix C describes college records data serving as the main source for measuring program impacts on educational progress. Appendix D provides detail on survey-based outcome measures, adjustments for item non-response, and analyses of survey non-response. Finally, Appendix E documents the research team's approach to outliers.

services (but could access comparable other services available in the community, including at PCC).

Between February 2012 and January 2014, PCC staff randomly assigned 1,217 study participants: 609 to the treatment group and 608 to the control group.

2.3.2. Characteristics of the Study Sample

Exhibit 2-2 shows the percentage distributions of the treatment and control group members across a series of characteristics. The p-values in the last column test the hypotheses that there are no systematic differences between the groups for these characteristics.[21] As shown, random assignment produced treatment and control groups with no significant differences in observed baseline characteristics.

Exhibit 2-2. Selected Characteristics of the Pathways to Healthcare Study Sample

Characteristic	All Participants	Treatment Group	Control Group	p-Value
Age				.320
20 or under	8.4%	6.9%	9.8%	
21 to 24	13.0%	13.3%	12.8%	
25 to 34	31.7%	32.2%	31.3%	
35 or older	46.9%	47.6%	46.2%	
Sex				.929
Female	82.7%	82.8%	82.7%	
Male	17.3%	17.2%	17.4%	
Race/Ethnicity				.631
Hispanic	55.8%	56.4%	55.2%	
Black Non-Hispanic	11.5%	12.3%	10.7%	
White Non-Hispanic	26.6%	26.6%	26.6%	
Other Non-Hispanic	8.0%	7.0%	9.1%	
Current Education				.779
Less Than a High School Degree	8.4%	7.9%	8.8%	
High School or Equivalent	34.5%	35.4%	33.6%	
Less Than 1 Year of College	16.4%	16.9%	15.9%	
1 or More Years of College	26.3%	26.5%	26.0%	
Associate's Degree or Higher	14.5%	13.3%	15.7%	
Income				.618
Less than $15,000	48.9%	50.1%	47.6%	
$15,000 to $29,999	36.2%	35.9%	36.6%	
$30,000 or More	14.9%	14.1%	15.8%	
Mean	$17,236	$16,817	$17,653	.294

[21] The p-value from chi-squared tests indicates the likelihood that the observed value or a larger value would occur if there was no difference between the two samples. For example, a p-value of .32 means that even if the characteristics of the members in the treatment and control groups were identical, the observed difference or a larger difference would occur 32 percent of the time.

Characteristic	All Participants	Treatment Group	Control Group	p-Value
Public Assistance / Hardship in Past 12 Months				
Received WIC or SNAP	68.3%	67.1%	69.6%	.345
Received Public Assistance or Welfare	7.7%	7.3%	8.1%	.676
Reported Financial Hardship	59.4%	61.6%	57.3%	.128
Current Work Hours Per Week				.211
0	65.6%	66.9%	64.3%	
1 to 19	6.8%	5.6%	8.0%	
20 to 34	15.6%	14.7%	16.6%	
35 or more	12.0%	12.9%	11.2%	
Expected Work Hours Per Week in Next Few Months				.408
0	30.4%	30.4%	30.5%	
1 to 19	5.8%	4.8%	6.8%	
20 to 34	37.4%	37.0%	37.7%	
35 or more	26.5%	27.8%	25.0%	

SOURCE: PACE Basic Information Form.

SNAP is Supplemental Nutrition Assistance Program. WIC is Special Supplemental Nutrition Program for Women, Infants, and Children.

NOTE: There are no significant differences at the p=.10 level. Appendix B provides a fuller set of baseline characteristics, also confirming that random assignment generated well-balanced treatment and control groups. Some percentages for characteristics do not add up to 100.0% due to rounding. Public Assistance/Hardship in Past 12 months does not add to 100% because the categories are not mutually exclusive and exhaustive.

Exhibit 2-2 also shows the composition of the study sample. The sample is consistent with the nontraditional student population that is characteristic of a program in the career pathways framework. Sample members are low-income; approximately half have annual household incomes of less than $15,000, and about 85 percent have incomes less than $30,000. Consistent with these low levels of income, about two-thirds received benefits from Supplemental Nutrition Assistance Program (SNAP, formerly known as Food Stamps) or Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). Public assistance or welfare (TANF) recipients, a target population for HPOG grantees generally, accounted for about eight percent of study participants. About three-fifths reported experiencing financial hardship in the past year. The program, like all HPOG grantees, also targeted TANF recipients. About eight percent of the sample received public assistance or welfare.

Participants are also older than traditional college students. About 80 percent were age 25 and older, and almost half were age 35 or older. They also had low levels of education; about 60 percent had less than a high school education, a high school degree or equivalent, or less than a year of college.

The great majority of study participants were female. More than half were Hispanic, due in part to the location of the program in southern Arizona. Most were not working at the time of random assignment, although the majority expected to start working in the following months, perhaps suggesting a need or desire to combine work and education and training.

2.3.3. Analysis Plan for the Impact Study

Prior to estimating Pathways to Healthcare impacts, the research team published an analysis plan specifying key hypotheses and outcome measures.[22] The team subsequently assessed data quality, refined the plan, and publicly registered it on the What Works Clearinghouse[23] and the Open Science Framework[24] websites. The purpose of the analysis plan and registration was to guide the work of the research team and publicly commit to particular hypotheses and an estimation approach and aligns with ACF's commitment to promote rigor, relevance, transparency, independence, and ethics in the conduct of evaluations.[25]

Pre-specification and registration help to establish the scientific rigor of research by documenting that inspection of early results did not influence the selection of findings in PACE reports.

Hypothesis Testing

An essential principle in the PACE analysis plan is to organize and discipline the number of statistical tests conducted. Like most social policy evaluations, the nine PACE studies target an array of different outcomes. If the evaluation did not adjust in some way for multiple hypothesis tests, a potentially large number of the tests would reach conventional levels of statistical significance by chance, even if there were no effect on any outcome. This is known as the problem of "multiple comparisons." To address this issue, the team established three categories of hypotheses: confirmatory, secondary, and exploratory:

- **Confirmatory tests** involve outcomes most critical to judging whether the program seems to be on track—that is, producing the results expected at a given follow-up duration. Given the relatively small sample sizes in the PACE studies, they generally limit such tests to one per program in the early impact report (at 18 months since randomization) and two tests in each subsequent report (at three and six years after randomization)—selecting outcome(s) under the "main" category in the program's theory of change (see Exhibit 2-1).
- **Secondary hypotheses** involve a set of additional indicators consistent with expected effects within the period covered by the study report. Each confirmatory and secondary hypothesis has a hypothesized direction of change, an increase or decrease in the outcome. Therefore, the research team tests each confirmatory and secondary hypothesis for significance only in the specified direction, ignoring possible effects in the other, by applying one-tailed tests of statistical significance.
- **Exploratory hypotheses** cover an additional set of possible effects whose direction and timing are less certain. Accordingly, the team is applying two-tailed tests to these hypotheses.

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22 See Abt Associates Inc. (2015).

23 The analysis plan was posted to the What Works Clearinghouse (WWC) online registry of randomized control trials (RCT) on May 20, 2016. In September of 2016, under the terms of a grant from the Institute of Educational Sciences, the RCT registry information was removed from the WWC website and transferred to the Society for Research on Educational Effectiveness (SREE). SREE plans to re-launch the registry in late 2017, at which time the analysis plan will be available in a searchable online database.

24 See https://osf.io/wcus9/.

25 See https://www.acf.hhs.gov/opre/resource/acf-evaluation-policy.

Chapter 5 identifies the specific hypotheses in each category tested for Pathways to Healthcare.

Impact Estimation

Random assignment ensures that on average, samples of treatment and control group members will have similar characteristics at the outset and that measured differences in subsequent outcomes provide unbiased estimates of program impacts. To address any effects on point estimates of chance differences arising from random assignment, analysts typically estimate impacts using a procedure that compensates for chance differences in measured baseline characteristics. Such procedures also help to increase the precision of estimates.

The approach applied in PACE involves, first, estimating a statistical model relating each outcome to baseline variables for the control group sample. Next, the procedure applies this model to calculate predicted values for each treatment and control group member. In the last step, the approach calculates average differences between actual and predicted values in both groups and differences the two averages to provide the impact estimate. Appendix B provides a detailed description of this method.[26]

The team estimated this approach both for continuous outcomes (e.g., total credits earned) and for binary outcomes (e.g., yes/no questions). For survey-reported outcomes, weights were used to average outcomes. Additional details can be found in the technical appendices.

Formally, estimation uses the following equation:

$$\hat{\delta} = \frac{1}{n_T}\sum_i T_i\left(Y_i - \hat{Y}_i\right) - \frac{1}{n_C}\sum_i \left(1 - T_i\right)\left(Y_i - \hat{Y}_i\right),$$

where $\hat{\delta}$ is the estimated impact of being in the treatment group (whether or not the person attended the program or used any of the offered services); Y is the observed outcome of interest (e.g., credits); $\hat{Y}$ is a prediction of Y based on baseline variables measured at random assignment; T is an indicator of treatment status (which is set equal to 1 if the individual is assigned to the treatment group and 0 if the individual is assigned to the control group); n_T and n_C are the respective sample sizes in the treatment and control groups; and the subscript *i* indexes individuals.

2.3.4. Analysis Plan for the Implementation Study

The PACE evaluation's implementation study relies on both qualitative and quantitative analyses, as well as a broad variety of data sources. Key analyses include the following:

- **Descriptive.** Describing each program's design and context and developing its theory of change relied primarily on review of program materials (e.g., its application to ACF for HPOG funding, in the case of Pathways to Healthcare); in-person discussions with program staff and leadership

[26] As explained in the appendix, the approach is a variant on the traditional approach to regression-adjustment methods used in impact analyses. The latter typically involves linear regression of each outcome on an indicator of treatment status and a series of baseline variables. In the traditional approach, the coefficient on the treatment indicator provides the regression-adjusted impact estimate.

during two rounds of site visits; and biweekly or monthly calls between study and program leadership during the study period when random assignment was ongoing.

- **Quantitative.** A quantitative analysis of the proportion of program participants who reached major program milestones served to systematically document their experience in the program. This relied on college records, follow-up surveys of treatment and control group members, and in the case of Pathways to Healthcare, the HPOG management information system.
- **Fidelity.** That quantitative analysis of how and the extent to which participants moved through the program also enabled the comparison of the actual delivery of the program versus its design. For Pathways to Healthcare, this involved examining at what level students entered the program, the proportion who completed or failed to complete one or more education or training programs, and the extent to which those who completed a program moved on to a subsequent one. To address the question of how program delivery changed over time, program staff were asked about internal or external obstacles and how they altered the program in an attempt to overcome them.
- **Service Differences.** Since the random assignment design of the impact study implicitly ensures that any effects of the program result from the different experiences of treatment and control group members, a key task of the implementation study is to describe the difference in services the two groups received. This is particularly important for the PACE evaluation, as the control group is not barred from receiving similar services to the study's treatment group (that is, in the case of Pathways to Healthcare, the 16 occupational training courses were open to both treatment and control group members).

2.4. Data Sources

The PACE evaluation's implementation and impact studies use a variety of data sources.

- **Baseline Surveys.** Prior to random assignment into the evaluation, program applicants completed two baseline surveys: The Basic Information Form (BIF) collected demographic and economic information. The Self-Administered Questionnaire (SAQ) measured a variety of attitudes, beliefs, and psycho-social dispositions, as well as more-sensitive personal characteristics. For the Pathways to Healthcare study, individuals who consented to participate completed the BIF and SAQ at their intake appointment at PCC.
- **Follow-Up Survey.** The research team sought to survey all PACE study sample members starting at 15 months since random assignment. On average, the survey occurred 19 months after random assignment. The survey asked questions on participants' training and service receipt, postsecondary educational attainment, employment, income, debt, and participation in income support programs. It used a mixed-mode approach, conducted initially by telephone and then in person for those participants not reached by telephone. For the Pathways to Healthcare study, Abt's survey unit, Abt SRBI, completed surveys with 500 treatment and 477 control group members, yielding response rates of 82 percent and 78 percent, respectively.
- **Administrative Records.** The PACE team relied on the administrative records of each program evaluated, both to describe the experience of treatment group members in their program and

to estimate program effects. For the Pathways to Healthcare study, the team used PCC's records to measure treatment and control group members' participation in education and training, as well as their credential receipt.

- **HPOG Performance Reporting System (PRS).** ACF required that all HPOG grantee programs use the PRS to record the activities and outcomes of program participants. For this report, the team accessed the PRS to identify participant activity and service data on study treatment group members in Pathways to Healthcare.
- **National Student Clearinghouse (NSC).** The NSC is a national repository of information that captures the vast majority of college enrollments at public and private nonprofit institutions. For Pathways to Healthcare, this report uses data from the NSC to impute outcomes for participants who attended colleges other than PCC.
- **Site Visits and Monitoring Calls.** For the implementation study, the evaluation team conducted two rounds of site visits to each PACE program. For PCC, the first visit occurred in May 2012, after random assignment began. The goal of this visit was to document the program's theory of change and key components (e.g., bridge programs and various forms of counseling) and to assess implementation of evaluation procedures. The second visit was in March 2014, after random assignment concluded. The goal of this visit was to document any modifications to operations or the provision of services, as well as implementation challenges and plans for sustaining the program beyond the study period. During both visits, the research team interviewed program managers; staff involved in evaluation activities (e.g., recruitment, intake, random assignment); instructors; advisors; case managers; and staff at any partner agencies with an important role in service delivery. In addition to these visits, the evaluation team had regular conference calls with program staff during the random assignment period to discuss program updates, recruitment activities, intake and random assignment processes and any challenges, engagement in the program by treatment group members, and staffing changes.
- **Program Documents.** The research team obtained and reviewed program documents, including funding applications; course catalogs; program materials such as applications, assessment tools, Individual Employment Plans, Training Plans, and pre-training checklists; annual reports; and reports to funders.

3. About Pathways to Healthcare: Context and Administration

Understanding the context in which a career pathways program such as Pathways to Healthcare operates generally, and its local context specifically, provides useful background on the forces shaping program design and implementation. This chapter begins with a description of that local context during time the program operated (2010 to 2015). Additional details about its program administration follow, including the division of responsibility for service provision and implementation of new program components.[27]

3.1. Local Context

Three aspects of the local environment are important to evaluating Pathways to Healthcare's design, implementation, and impacts: target population demand for the program, the local labor market, and the presence of comparable services in the community.

3.1.1. Population

The first important contextual factor is whether there is a sizable target group who might benefit from the program. Pima Community College has operated traditional healthcare occupational training courses for many years. To be eligible for Pathways to Healthcare, applicants had to reside in Pima County, have income at or below 70 percent of the Lower Living Standard Income Level,[28] be eligible to work,[29] and have an interest in a healthcare-related career.

Pima County, located in southern Arizona on the border with Mexico, is urban and ethnically diverse. The county has more than 1 million residents and Tucson (population 527,972 in 2014) is the largest city.[30] In 2014 the population was more than one-third Hispanic (36 percent); more than one-quarter (29 percent) spoke a language other than English at home.[31]

The median household income in Pima County was $46,233 in 2014, lower than for Arizona ($49,928) and the United States ($53,657).[32] Many households fit the program's income criterion: more than one-quarter (27 percent) had an annual income of less than $25,000 and an additional 12 percent had an annual income between $25,000 and $34,999. About 12,000 households received cash public assistance

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27 For additional information about the planned study design, please see Engstrom, Whitney, Gardiner, Karen and Olenka Mitukiewicz (2013).

28 Lower Living Standard Income Level is a measure, determined by the Department of Labor, to establish low-income status. In 2013, for a family of four in Pima County, 70 percent of the Lower Living Standard Income Level was $27,724. This is about 16 percent higher than the poverty guideline the same year for a family of four ($23,850). https://aspe.hhs.gov/2014-poverty-guidelines.

29 To participate in an HPOG-funded program, individuals needed to be authorized to work in the United States.

30 U.S. Census Bureau, Vintage 2014 Population Estimates: Sub-county Population Places and MCDs.

31 U.S. Census Bureau, 2010–2014 American Community Survey 5-year Estimates.

32 Pima County data from https://www.census.gov/quickfacts/table/PST045215/04019. Arizona data from https://www.census.gov/quickfacts/table/PST045215/04. U.S. data from https://www.census.gov/data/tables/time-series/demo/income-poverty/cps-hinc/hinc-01.html.

income (three percent of households) and 57,000 (15 percent of households) received SNAP benefits in the past 12 months.[33] The 2014 poverty rate, 19 percent, had increased 3 percentage points from 2010.[34]

3.1.2. Local Labor Market

A second contextual factor is whether the local labor market offers sufficient jobs in the occupations for which program participants trained. If jobs are not available, Pathways to Healthcare's goal of successful career-track employment for its program completers would not be attainable.[35]

Overall, the local economy improved during the years the program operated (2010 to 2015). In March 2015, the Pima County unemployment rate was 5.4 percent, 0.7 percentage points lower than one year prior.[36] The types of healthcare jobs for which Pathways to Healthcare provided training are a growing segment of the local economy. In 2013, "healthcare practitioner and technical"[37] occupations accounted for 6.7 percent of employment in Tucson (compared with 5.8 percent nationally), and "healthcare support"[38] occupations accounted for 2.9 percent of jobs in Tucson (the same proportion as nationally). Occupational projections for the Tucson metropolitan statistical area are that over the next 10 years, "healthcare practitioner and technical" occupations will increase by 18 percent and "healthcare support" ones by about 23 percent.[39]

In its HPOG grant application, PCC also noted that every year thousands of people retire to the Sun Belt (including Tucson) and that Arizona, relative to other states, has a low number of caregivers (2.3 per 1,000 residents compared with 3.5 nationally). The aging population could easily "overwhelm" the healthcare system.[40]

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[33] Selected Economic Characteristics 2010-2014 American Community Survey 5-Year Estimates for Pima County. http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.

[34] Selected Economic Characteristics 2010-2014 American Community Survey 5-Year Estimates for Pima County and Selected Economic Characteristics 2006-2010 American Community Survey 5-Year Estimates, http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.

[35] The HPOG program aimed to address this concern by requiring grant applicants to identify target trainings in fields with expected employment growth.

[36] See http://data.bls.gov.

[37] The occupational group includes physicians (e.g., internists, surgeons, and obstetricians), nurses (e.g., registered, midwives, nurse practitioners, LPNs and LVNs), dietitians and nutritionists, pharmacists, physical therapists, medical and clinical laboratory technicians, medical records and health information technicians among others. Source: http://www.bls.gov/oes/2015/may/oes_46060.htm#31-0000. Divided employment for occupational group by employment for all occupations.

[38] This occupational group includes home health aides, nursing assistants, orderlies, occupational therapy assistants and aides, medical assistants, and phlebotomists, among others. Source: http://www.bls.gov/oes/2015/may/oes_46060.htm#31-0000. Divided employment for occupational group by employment for all occupations.

[39] https://laborstats.az.gov/employment-forecasts 2012-2022 Tucson MSA Occupation Projections Tables & Graphs.

[40] Application for Federal Assistance, Pathways to Healthcare Professions.

3.1.3. Comparable Services

The third contextual factor (and the one most pertinent to the evaluation's random assignment design) is the degree to which comparable educational opportunities and supports were available elsewhere locally. Programs have the greatest potential to produce impacts when they offer services distinguishable from those already available in the community. The nature of other educational opportunities and supports in the community also has some bearing on program completers' ability to build on initial training successes after leaving the program.

In terms of Pathways to Healthcare study, students in the control group could piece together a similar package of services to that provided to students in the treatment group—except they would not have access to the more-specialized advising to help them navigate barriers in the college, employment services, and financial aid systems. Exhibit 3-1 summarizes the difference in services available to the study's control group and treatment group members. (The following section of this chapter describes administrative responsibility for each Pathways to Healthcare component in more detail.)

Exhibit 3-1. Comparison of Career Pathways Components Available to PACE Control Group and Treatment Group Members

Career Pathway Component	PCC and PCOS Services Available to Control Group	Pathways to Healthcare Components Available to Treatment Group Only
Assessment	• TABE testing at PCOS • ACT Compass testing at PCC	• Assessment of goals and barriers to program participation and success
Curriculum	• Basic skills education at PCC or other community locations • 16 occupational training programs	• Accelerated basic skills College Readiness class or open lab for those who do not test into their training of choice • Organization of the 16 programs into five pathways • Dedicated Nursing Assistant program
Supports	• Academic advising through the PCC student service center and/or PCC Center for Training and Development • PCC tutoring services • Financial aid based on eligibility and availability (e.g., Pell grants, Individual Training Accounts through PCOS)	• Two dedicated PCC academic advisors • Dedicated PCOS advisor to assist with identifying and addressing barriers • Instructional supports (study groups, program readiness classes, tutoring) • Follow-up support after program completion • Tuition scholarship • Other support services (e.g., uniforms, transportation vouchers, licensure testing)
Employment Services	• Standard employment services from PCOS	• PCOS employment supports • Program-specific employment specialist • Program-specific workshops • Networking group

SOURCE: Program documents and site visits.

Training. The PCC Center for Training and Development (CTD) has provided credit and noncredit workforce training for more than 40 years, offering certificates in healthcare and other fields. In addition to career training through CTD, PCC's six campuses offer credit courses that award certificates and Associate's degrees in a variety of healthcare fields, including Health Information Technology and Emergency Medical Technician (EMT). Control group members could access the 16 occupational programs in Pathways to Healthcare, with the exception of one evening Nursing Assistant course taught

by an HPOG grant-funded instructor.[41] The dedicated course served two purposes. First, Nursing Assistant was a popular program and reserving classes ensured spaces for program treatment group members. Additionally, program leadership aimed to create a cohort environment to give students a sense of community as they worked together and progressed together.

The 16 occupational training programs varied in length from one to 24 months, whether they resulted in a degree or a certificate, and whether completers obtained credits or clock hours. Most PCC programs included a work-based learning component in the form of an internship or externship, a clinical, or a preceptor model.[42] Appendix A provides details about the programs.

Advising. All PCC students could access the advising offered through its Student Service Center at each campus and the CTD. This advising generally focused on academic issues—as opposed to the specialized advising available only to treatment group students to identify and remove barriers that could prevent their enrollment and completion of programs. The Student Service Center advisors were available as requested to discuss an area of study or major, procedures for enrolling in classes, and transferring to another institution of higher education. The CTD advisors provided guidance on occupational program requirements and completion of a program-specific CTD "passport"—a checklist of steps students must complete prior to starting a program. Exhibit 3-2 shows the passport for the Nursing Assistant program.

Exhibit 3-2. Nursing Assistant Passport

- Attend CTD information session
- Complete application for admission to college
- Schedule and take Compass assessment; participate in advising immediately following assessment
- Attend Nursing Assistant Requirements workshop (offered weekly)
- Complete Material Checklist:
  - Nursing Student Questionnaire
  - Student Profile/Resume
  - High School Diploma/GED
  - Fingerprint Clearance Card
  - Photo ID
  - Immunization Record
  - Proof of Legal Residence
- Verification of payment
- Program assigned start date
- Register for program:
  - Complete enrollment form
  - Complete FERPA form
  - Health Declaration; proof of health insurance
  - TB skin test
  - Uniform order form and book list

Employment Services. Control group members could seek employment services through one of PCOS's two locations. As the local One-Stop Career Center (now American Job Center) operator,[43] PCOS provided a number of Workforce Investment Act (WIA) "core" employment services to all customers, such as job banks, workshops, and resume preparation assistance. Additional services, such as development of Individual Employment Plans, career counseling, and training necessary to obtain employment, were

[41] Staff noted the instructor also had more control of messaging, in that she could discuss and encourage students to attend instructional supports such as study groups that were open only to Pathways to Healthcare participants.

[42] *Clinicals* are part of the class that occurs at a work site. The *preceptor* model is similar to a residency, in which the student works with someone who has a similar or higher level of qualifications.

[43] The Pima County Workforce Investment Board provided oversight of PCOS.

available to eligible individuals.[44] In an effort to isolate Pathways to Healthcare services to the treatment group for the evaluation, PCOS implemented program services in only one of its two offices, Rio Nuevo, which is adjacent to a PCC campus. Control group members could continue to access its standard services at its Kino location.

Financial Support. A final aspect of the service environment is the availability of financial support for training. These include Pell grants for students who meet the general federal student aid eligibility requirements[45] and Individual Training Accounts for those who met WIA eligibility criteria.

In summary, there was a large, low-income population in Pima County and thus potentially sufficient demand for the Pathways to Healthcare program. Jobs for which program participants trained were expected to be a growing sector of the economy. Finally, control group members could feasibly create a package of services similar to the Pathways to Healthcare program, including occupational instruction (but not the bridge programs), limited advising, financial aid (if eligible), and employment services. Students would need to be proactive in seeking services, though.

3.2. Program Administration

With Pathways to Healthcare, Pima County Community College and the Pima County One-Stop aimed to provide a holistic, seamless program for students that incorporated instruction, advising, and employment services.[46] PCC and PCOS had collaborated prior to the grant. For 10 years, PCC housed two liaisons at a PCOS office to help streamline the admissions, advising, and financial aid processes for individuals enrolling in PCC training programs. With the Pathways to Healthcare program, PCC leadership sought to reach a lower-skilled population that may need to start at the bridge level and progress to occupational training. PCOS leadership expressed a desire to expand the traditional workforce investment system model—of short-term training and credential followed by employment—with a training pathway.

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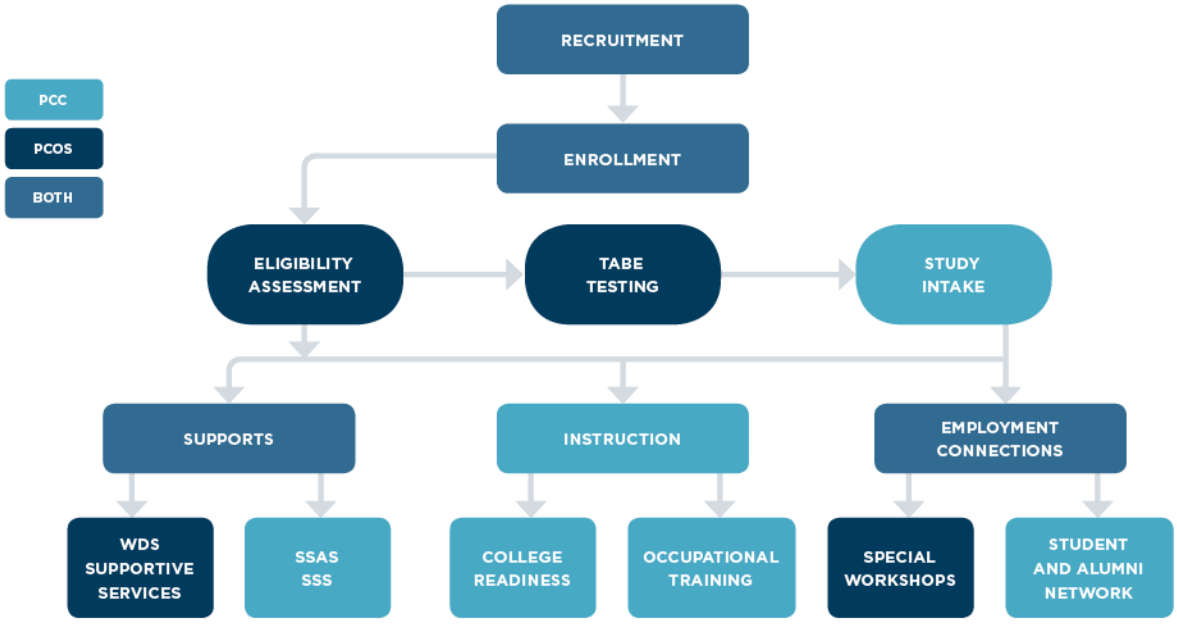
[44] To be eligible for those WIA "intensive services" individuals had to be unemployed, receive at least one core service, unable to find employment, and determined by staff to need the additional services to obtain employment. To be eligible for the training, individuals had to meet the eligibility requirements for intensive services and have been determined to be unable to obtain or retain employment through such services. Eligible individuals used an Individual Training Account to fund training at a qualified training provider.

[45] Basic financial aid eligibility includes having a high school diploma or GED, being enrolled or accepted into an eligible degree or certificate program, registering for the Selective Service (if male and age 18 or older), and having a valid Social Security number. https://studentaid.ed.gov/sa/eligibility#basic-criteria.

[46] The HPOG Program required coordination and collaboration with a specified set of partners and encouraged partnerships with others, not only to provide healthcare training to HPOG participants, but also to leverage community resources essential for providing them multiple supports. The HPOG Funding Opportunity Announcement specified that successful grant applicants were required to partner with state and local WIBs, TANF agencies, and state apprenticeship agencies. Additionally, it strongly encouraged engagement of employers and business organizations that could provide training and employment opportunities as well as guidance to ensure that training met local market demand. Other suggested partners included members of the education and training community, non-profit organizations, labor organizations, organizations implementing the Recovery Act, foundations, and social service agencies.

This section describes organizational responsibility for study and program components. Chapter 4 provides details about the components as implemented. As Exhibit 3-3 (below) shows, PCC and PCOS shared responsibility for study and program implementation.

Exhibit 3-3. PCC and PCOS Service Provision



3.2.1. Recruitment

The two organizations jointly undertook recruitment activities. Staff members of Pathways to Healthcare initially recruited program applicants primarily through PCC and PCOS. This included PCC students interested in CTD programs, as well as job seekers and other employment service users at PCOS. Staff distributed flyers describing Pathways to Healthcare and its enrollment steps at the CTD and student centers across all six PCC campuses, and displayed them in the PCOS Rio Nuevo office. They described the program at community events. Additionally, they sought to engage community service providers as referral partners, including the Pascua Yaqui One-Stop, Joint Technical Education District, Jobs Corps, and Arizona Department of Economic Security (and its TANF employment services contractor, ResCare Workforce Services).

These recruitment efforts were sufficient to fill program slots. When Pathways to Healthcare entered the PACE evaluation in February 2012, staff needed to effectively double the number of applicants to have sufficient numbers for the treatment and control groups, thus explored other marketing venues. As Exhibit 3-4 shows, during the PACE study period, staff used print, electronic, and other media to advertise the program.

Exhibit 3-4. Getting the Word Out

- Tucson Weekly (began March 2013)
- Bear Essentials, a weekly circular distributed at doctors' offices (began March 2013)
- Radio ads (began May 2013)
- Pima CCTV (began October 2013)
- TV ads (CW, FOX, ABC; December 2013–January 2014)
- "Michelangelo" ads on the interior ceilings of buses (July 2013 through June 2014)
- Billboards (December 2013, January 2014)
- Ads in bus stops (began April 2013)

According to staff, the overwhelming majority of study participants learned about the program through PCC or PCOS. Additionally, staff reported word-of-mouth was a common recruitment source.

3.2.2. Enrollment

Both organizations also conducted Pathways to Healthcare program enrollment and PACE study enrollment activities. As noted in Chapter 2, PCC and PCOS staff held weekly information sessions for prospective Pathways to Healthcare applicants that described program components, eligibility requirements, the 16 occupational training programs and their mean wages,[47] and during the study period, admission into the program through random assignment.

Those interested in Pathways to Healthcare then attended an intake appointment at PCOS, where staff determined their income and residence eligibility. Those deemed eligible took the TABE to determine if they would start in College Readiness or occupational training. Those who scored within the pathway range[48] took the ACT Compass® to determine their starting level within a pathway.

Applicants then proceeded to a PACE study intake appointment with a PCC advisor and, as noted in Chapter 2, completed the study-related informed consent form and baseline surveys (BIF and SAQ). For those randomly assigned to the treatment group, the advisor scheduled their first advising appointment at PCOS.

3.2.3. Services

Supports. Staff members of both organizations advised program participants (treatment group), with the goal of identifying academic and nonacademic issues that could impede their enrollment, persistence, and completion of their training program of choice. Program staff referred to advising as "holistic" because it encompassed more than academic issues. The six PCOS Workforce Development Specialists (WDS) assessed students for barriers to program retention and completion, helped secure needed supportive services, and continued to follow up with them for the duration of their involvement in the Pathways to Healthcare program. The WDSs also were the students' first point of contact for developing a Training Plan and determining their financial aid needs. Pathways to Healthcare provided scholarships to all study participants approved for occupational training; however, if the course cost exceeded the scholarship ($3,500 during the PACE study), the WDS helped the students apply for Pell grants or Individual Training Accounts (if eligible).

PCC provided academic advising. Its four Student Services Advanced Specialists (SSAS) worked with treatment group members prior to the start of their occupational training. Once training started, each student was assigned to one of the four Student Service Specialists (SSS), and that advisor continued to provide academic and career advising.

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[47] As a result of this practice, control group members in the PACE evaluation would have had some exposure to the "levels" scheme because the handout preceded random assignment. The first discussion of "pathways" and the participants' starting point on their pathway of choice, however, did not occur until the first advising session and thus was offered only to treatment group members.

[48] The specific TABE requirements for entry into PCC's healthcare training programs varied, but the minimum for entry was approximately basic skills at a ninth-grade level.

Instruction. PCC provided all instruction, including the two College Readiness bridge programs and the 16 occupational training courses. PCC also implemented instructional supports such as tutoring and study groups to help treatment group members succeed in occupational training.

Employment Connections. Finally, both organizations provided employment services. PCOS developed and implemented Pathways to Healthcare–specific workshops that covered topics such as interviewing skills and resume development, and provided, job search guidance. As well, HPOG funds supported one Employment Specialist to communicate with employers and advise program staff on hiring trends. PCC staff launched the Student and Alumni Network to help Pathways to Healthcare students prepare for employment.

4. Implementation Study Findings

Prior chapters described the signature components of the Pathways to Healthcare program, as well as the contextual factors that could facilitate or impede program implementation and outcomes for participants. This chapter reports on the services actually implemented. It then describes patterns in how participants experienced the Pathways to Healthcare program, including enrollment in its bridge programs, occupational training courses, and services. It concludes by comparing education and training and service receipt for the treatment group versus the control group.

4.1. Implementation of Education and Training Services

Through interviews with program staff during two rounds of site visits and monthly calls, the research team assessed the degree to which Pathways to Healthcare education and training services were implemented as planned. Key findings are summarized below.

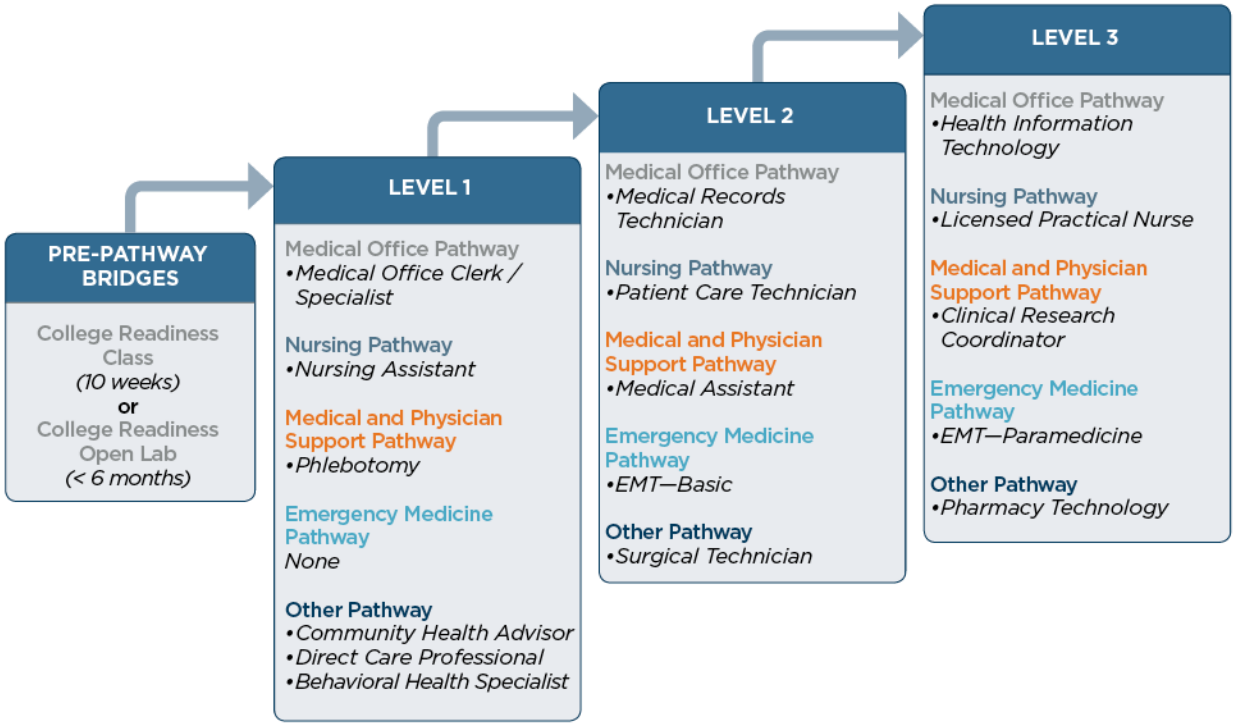
- ***Pathways to Healthcare mapped PCC's 16 existing occupational training programs into five distinct occupational pathways.***

One of the key Pathways to Healthcare program strategies, as described in its HPOG grant application, was to organize occupational training programs into pathways in order to simplify enrollment and placement in the right program, as well as to focus participants on longer-term training goals. As Exhibit 4-1 shows, the five pathways were Medical Office, Nursing, Medical and Physician Support, Emergency Medicine, and Other pathways. Within each pathway, programs were designated as entry level (Level 1), mid-level (Level 2), or advanced level (Level 3). Programs within each pathway were structured so that Level 1 programs included all pre-requisites for Level 2 ones, and Level 2 programs included pre-requisites for Level 3 ones.[49]

PCC leadership used a number of criteria to create pathways. First was "stackable" credentialing, meaning there was a natural sequencing of programs and associated credentials that recognized student progress. For example, Nursing Assistant (Level 1) instruction and clinical work was completed before that for Patient Care Technician (PCT, Level 2), which enables a nursing assistant to also work in hospitals rather than just in nursing homes. PCT in turn is a lower-level credential than Licensed Practical Nurse (Level 3). The type of credential also determined a program's location on the pathway. Degree programs (versus certificates) were designated Level 3; for example, completing the Pharmacy Technology program results in earning an Associate degree.

[49] The exception is the Other pathway. Level 1 programs could be linked—for example, Direct Care Professional and Behavioral Health Specialist could be linked because direct care was a good foundation for work as a behavior health specialist. There was less of a pathway from Level 1 to 2 and Level 2 to 3. In its subsequent HPOG grant Pima Community College discontinued this pathway.

Exhibit 4-1. Pathways for Healthcare Overview



PCC tied student learning outcomes to expected outcomes in the industry, with each level indicating greater mastery. Level 2 tasks were more complex than Level 1's, and Level 3 tasks were more complex than Level 2's. Level 1 programs, for example, equipped students with basic occupation-specific knowledge (e.g., recall of data) and comprehension (e.g., understand the meaning, translation, and interpretation of instructions and problems). Level 2 programs required application of knowledge and skills, such as applying what was learned in the classroom to new workplace situations. Level 3 programs focused on analysis (e.g., breaking something down into its parts), synthesis (e.g., creating something new by putting together different ideas), and evaluation (e.g., assessing the value of ideas or actions for a particular situation).[50]

Although each next step on the pathway was clear, program staff encouraged nearly all participants who completed an occupational training program to work in the field for at least six months, to gain experience and ensure the occupation was a good fit, before they returned for additional training. The exception was the transition from Nursing Assistant to Patient Care Technician, a four-week add-on course, which immediately opened additional employment opportunities for them.

[50] PCC leadership pulled from a variety of research sources in designating levels, including the National Institute for Learning Outcomes Assessments; the John N. Gardner Institute for Excellence in Undergraduate Education; and Taxonomy of learning types (see Bloom's taxonomy at https://academic.udayton.edu/health/syllabi/health/Unit01/lesson01b.htm and http://files.eric.ed.gov/fulltext/EJ963323.pdf).

- ***Low-skilled students enrolled in the College Readiness bridges to improve basic skills relatively quickly.***

As shown in Exhibit 4-1, the College Readiness class and open lab were pre-pathway bridges, available only to members of the treatment group. Both noncredit bridges aimed to help students increase their academic skills in less than a semester so they could get the necessary score on the Compass to begin their occupational training of choice. Overall, 26 percent of treatment group members enrolled in College Readiness, about equally split between the class and the lab. All participants who enrolled in College Readiness completed it, and half proceeded to occupational training (see Exhibit 4-6 in Section 4.4 below).

Individuals could select the College Readiness format. Whether a participant enrolled in the class versus the lab was generally a function of schedules. Students who worked during the day and could not commit to a structured class tended to enroll in the lab. As well, students whose TABE scores and academic history suggested they could achieve the requisite Compass score within a few weeks were referred to the lab.

The **College Readiness class** as implemented was 10 weeks long and met four days per week, six hours per day. PCC operated two classes simultaneously at different locations. The curriculum included modules on math (e.g., word problems, fractions, graphs and charts, ratios) and reading and writing (e.g., critical thinking with reading passages, essay writing). In addition to basic skills, the class incorporated college and career success topics (e.g., time management, test taking, understanding how to learn). PCC staff noted an added benefit was the camaraderie that developed among classmates. Students studied together and carpooled. As noted further below, program leadership explored ways to instill a sense of fellowship among students in occupational training programs. Participants had completed the class when their Compass scores met the requirements of their training program or when they reached 80 percent attendance. If they did not test high enough on two areas of the Compass, they returned to the class. Those who needed to improve only one area could retake the class or go to the lab. The **College Readiness open lab** was self-paced. Students developed personalized plans that described areas of focus (e.g., math, reading) and used computer-assisted instruction (Aztec software) to improve their basic skills.

Both bridges used adult learning techniques. The College Readiness class instructors used contextualization (e.g., placing basic skills in the context of a healthcare occupation) and active learning formats such as group work and problem-solving tasks. Exhibit 4-2 shows examples of their instruction methods.

In the self-paced lab, the on-site College Readiness instructor did not present material, but was available to help as needed, monitored students' work in Aztec, and followed up with those who were not progressing. Students also received one-on-one assistance from the instructor or an on-site math tutor, as needed. Those with transportation or scheduling issues that prevented frequent attendance at the lab could receive personalized instruction via email and phone.

Exhibit 4-2. Instructional Approaches Used in College Readiness Class

- **Writing instruction.** A tool called "E-journaling" helped familiarize students with computers and professional writing. Each week students responded to a question from the instructor in writing, which was reviewed and edited by the instructor. Students started with an entry about goals.
- **Reading comprehension and speaking.** Students participated in a book club to hone their reading and speaking skills. The instructor addressed conventions such as bold and italics and what they meant, and asked questions to gauge understanding. Students read aloud from the book and the instructor corrected their pronunciation as needed. Each reading assignment incorporated a healthcare theme. For example, the group read Christy Brown's memoir My Left Foot and discussed resources available to individuals with cerebral palsy in 1930s Ireland and how it would be different today.
- **Note taking to prepare for occupational training courses.** The instructor demonstrated how to use marginal notes, underlining and starring text, drawing pictures, and abbreviating, as well as flash cards, to help students understand medical terminology.

  "I tell them that in the act of writing out those note cards, you will be a step closer to memorization. Every time you take a look at them, it is like a ritual. First you write them and then you go over them, and go over them again. When you think you got it down is when you quiz yourself without looking at the other side."
- **Contextualization.** The college readiness instructors contextualized basic skills to healthcare. For example, an instructor described a quiz designed to support reading comprehension that covered a chapter from a Nursing Assistant textbook. Or, when studying ratios, the instructor asked students how they might use ratios in healthcare (e.g., what is the ratio of patients to nurses?).

College Readiness instructors of both bridges used field trips to PCC's Center for Training and Development (where students attended an orientation session and observed training classes delivered there) and guest speakers to help participants focus on their occupational training goals. During the study period, one guest speaker was a University of Arizona Student Clinic employee who had graduated from PCC with a Medical Assistant certificate after first attaining his GED. A College Readiness class student said, "This got me pumped up. If this guy did not have a high school diploma, got his GED, and now works at U of A, why can't I do it?"

- ***Pathways to Healthcare staff developed and implemented instructional supports in response to identified student needs.***

The application for HPOG grant funding did not specify instructional supports, but instructors and PCC advisors observed that some students had difficulty persisting in their courses. In response, they proposed a number of supports to help students master course content and learn college success skills. They also aimed to foster a sense of community among the students in the occupational training courses akin to what they observed among College Readiness classmates.

Two training programs, Pharmacy Technology and Nursing Assistant/Patient Care Technician, implemented weekly **instructor-led study groups**, team-taught between a College Readiness instructor and an occupational training instructor, to help the programs' students bolster their basic skills and learn occupational content. In Pharmacy Technology, this involved computer skills and completing online coursework; in Nursing Assistant/Patient Care Technician, the occupational training instructor asked students to "drive" the focus of each group meeting based on what material they had difficulty learning. In both groups, the College Readiness instructor focused on college success skills (e.g., test taking) and life skills (e.g., time management). Additionally, the Nursing Assistant/Patient Care Technician instructor held a weekly study hall to build students' study skills and answer any course content questions.

PCC also implemented the **Pre-LPN Reading Group** for treatment group members trying to achieve the Compass reading score of 90 or above necessary to qualify for the Licensed Practical Nurse program. During its twice-weekly meetings, the instructor focused on test-taking skills and reading strategies, while the group read a few pages of an assigned book. For example, Jean-Dominique Bauby's memoir of his stroke, The Diving Bell and the Butterfly, was selected for its extensive health-related vocabulary.

A College Readiness instructor, Nursing Assistant instructor, and a PCC advisor developed and implemented the **Nursing Assistant Readiness Class** in January 2014 after determining that many students did not have the college success skills needed for that program. The College Readiness instructor delivered the class in two sessions over two consecutive days, using a chapter in the Patient Care Technician textbook to explain how to read a chapter, what to highlight, and how to break up the content into smaller parts, and then quizzed students on the material.

Occupational training instructors or other Pathways to Healthcare staff referred treatment group members to a College Readiness instructor for **individual tutoring** if they were struggling academically. The College Readiness instructor described a "coaching" philosophy, in which the student is guided in decision making. Tutoring primarily focused on learning strategies (e.g., reading comprehension techniques and study skills) and coaching to help students consider what choices they might need to make to be successful in the program, such as freeing up time to study. Data from the HPOG Performance Reporting System showed that more than one-third of Pathways to Healthcare participants (37 percent) received tutoring.

4.2. Implementation of Advising

For Pathways to Healthcare, PCC and PCOS sought to expand advising beyond what already was available at the college and the local One-Stop Career Centers, with the goal of helping program participants attain a credential. This section describes the implementation of advising services.

- ***Pathways to Healthcare implemented three advising positions that aimed to identify and address barriers and "connect the dots" between steps on the pathways.***

The three positions—Workforce Development Specialist (WDS), Student Services Advanced Specialist (SSAS), and Student Services Specialist (SSS)—were expected to collaborate to address the range of issues that could affect a program participant's ability to enroll in a training program, persist, and complete it. Some potential barriers were external to the program, such as child care, transportation, or low income. Others were internal, such as navigating the college bureaucracy (e.g., fulfilling pre-enrollment requirements, securing financial aid, registering for classes).

The first advising meeting, with the WDS, occurred within 2 weeks of random assignment and focused on identifying barriers and needed supports. Within a week of this meeting, the student met with an SSAS to begin discussing pre-training activities (e.g., those outlined in the student's program-specific passport, as shown in Exhibit 3-2). According to a PCC staff member, these initial dual WDS and SSAS advisors helped keep students from losing their way early in the program: "You have an appointment, and then set up your next steps—your Workforce Development Specialist appointment and your advising appointment. It is bringing people in, in a very structured way, not a 'come and see us in 3 months and we will assist you."

At the first meeting, the WDSWDS oriented the student to the Pathways to Healthcare program using a Participant Plan—a checklist of all of the steps from pre–Pathways to Healthcare program enrollment through employment (Exhibit 4-3). The plan was intended to be a blueprint that connects all program-related steps for students, as well as a tool that staff used to track students' progress.

The WDS also used the Individual Employment Plan to identify barriers to participation and service needs, such as child care, a driver's license, family issues, legal issues, health issues, and financial issues. The WDS was responsible for coordinating supports and could authorize up to $1,400 in supports per student to address identified barriers. As needed, the WDS made referrals for other services including SNAP benefits and health insurance navigators.

The WDS then discussed short- and long-term occupational goals and introduced the Training Plan. This was the first in-program discussion related to career pathways. For example, a student might want to train as a Licensed Practical Nurse (Level 3). However, based on her TABE scores and educational history, she and the WDS might discuss instead starting at Nursing Assistant (Level 1). The Training Plan was a checklist of preparatory activities required to enroll in a particular program. Among other requirements, the plan included the student interviewing two or three professionals in the employment area of interest to confirm that the occupation was a good match; enrolling in the Employability Skills Workshop to understand what employers will look for on the job[51]; developing a personal budget to determine how the student will combine training with other obligations (e.g., whether the student has to work full time); and applying for a fingerprint clearance card if the program requires it. The WDS advised the student on completing the Training Plan (Exhibit 4-4 shows an example of guidance).

Exhibit 4-3. Pathways to Healthcare Participant Plan Checklist

- HPOG (program) information session
- Intake eligibility/commitment appointment
- PCOS WDS appointment
- Referred to College Readiness (Y/N)
  - TABE scores
  - ACT Compass scores
- Mandatory Employability Skills Workshop
- PCC advising (SSAS)
- CTD information session
  - Received program passport (Y/N)
- PCC credit: completed degree plan (Y/N)
  - Applied for FAFSA (Y/N)
- SSS meeting
- Passport completion
- Training Plan completion
- Training Plan approved
- Training completed
- Workshops:
  - 123 Work
  - Job Offer Academy
  - Resume Writing
  - Interview Technique
  - Computer Workshop
  - Pesco Sage (career assessment that tests academic skills, aptitudes, learning styles, work attitudes, temperament and work ethic)
- Employment specialist meeting
- Employed

[51] Standard workshop required for all WIA participants.

The WDS generally scheduled a follow-up appointment two weeks later to finalize the Individual Employment Plan and the Training Plan, including how the student would cover any costs in excess of the Pathways to Healthcare scholarship (described below). Subsequent contact between the WDS and student varied depending on needs. At a minimum, the WDS contacted the student monthly to assess whether barriers remained.

Exhibit 4-4. Example of WDS Guidance on Completing the Training Plan

One WDS described how she helped students set up informational interviews:

> I like Indeed.com because it uses all the different websites. I tell them go into this website, and I walk them through it. We see all these jobs. I go over minimum qualifications … let them know, "These are all things you may even [get] when you are done with your training" I tell them, "See these people? They are hiring. Let's get their phone numbers so you can call them." Then I give them a little blurb of how to contact Human Resources: "Say who you are, why you are calling, you are enrolled in this program at Pima College and you wonder if you could have a little bit of their time, meet with one of their medical assistants, so you can see if this is the career for you" … so they won't call and say, "I need to interview somebody."

The WDS referred the student back to the SSAS with a recommendation for either remedial education (College Readiness) or occupational training. The SSAS worked with the former group of students until they completed their College Readiness class or lab and enrolled in occupational training, and with the latter group until they enrolled in occupational training. During the first meeting, which generally occurred about a week after the initial WDS meeting, the SSAS helped each student complete the Training Plan. Unless the student was starting in College Readiness, the SSAS signed up the student for the Compass assessment and introduced the CTD passport. The number of SSAS-student meetings prior to the start of occupational training varied; if students were working through a number of pre-training steps, the SSAS tried to engage them at least monthly. The SSAS also advised students after they enrolled in College Readiness.

Students were assigned to an SSS when they were ready to begin their occupational training program. The SSS provided academic advising for the student's specific pathway and helped arrange educational supports, course scheduling, book purchases, and if needed, tutoring. The frequency of SSS-student interactions varied, as did the mode of communication. Many SSSs noted they preferred emails to in-person or phone conversations because they rotated between campuses. SSSs also described "dropping in" on classes primarily as a reminder of their presence (e.g., "Come see me if you need help with…"). Although SSSs worked one-on-one with students only after they were ready to begin occupational training, one SSS also visited the College Readiness class weekly to encourage them to take the Compass, answer questions about financial aid, or help them with their next steps related to training.

- ***Advisors helped participants secure funding for training programs.***

A key financial support was the Pathways to Healthcare scholarship, which was available to all program participants with an approved Training Plan. During the years the program was part of the PACE study, the per-student scholarship (for tuition and books) was roughly $3,500. For more expensive programs such as Licensed Practical Nurse, Medical Office Specialist, and Medical Records Technician, Pathways to Healthcare supplemented this amount with an additional $3,000 in WIA funds.

If the scholarship did not fully cover the cost of training, the WDS helped the student apply for a Pell grant or other funding. Program participants who subsequently pursued a higher-level program of study could receive additional funds, based on availability.[52]

4.3. Implementation of Employment Supports

As noted above, most program completers were encouraged to work for at least six months before they returned for another training program and certification. When Pathways to Healthcare was first implemented, its students could access the range of employment services at PCOS available to all job seekers (see Chapter 3). The program also funded an employment specialist to work with employers in the community and advise the program on hiring trends. However, over the course of implementation, staff developed Pathways to Healthcare–specific employment services to facilitate the transition from training to employment.

- ***Program staff designed and implemented three workshops to aid program participants in the transition to employment.***

Program staff observed that many students had difficulty transitioning from training completion to employment. In October 2013, the start of Pathways to Healthcare's fourth year, PCC leadership created a Transitions Workgroup to explore how to engage students at points where they were likely to drop out, including the transition to employment. The workgroup created three PCOS-based employment services specifically for Pathways to Healthcare participants.

The **Job Offer Academy** for students targeted those who completed a training program and were dissatisfied with their job search results.[53] The three-week, 35-hours/week Academy was customized for the healthcare industry. Attendees signed a commitment form and agreed to attend every day and to wear appropriate job search attire to class. Participants received one-on-one video coaching for interviewing, data on potential medical employers, and job search guidance from a job coach. Though PCOS noted the academy's 100-percent job placement rate, PCC staff indicated that at least during the study period, few students signed up for the Academy and it was not offered frequently.

The six-hour student workshop **123 Work** was created as an "employment transition workshop" designed to make students more competitive job candidates. Topics included goal setting, identifying transferrable skills, customizing resumes, the application process, interviewing tips and techniques, life management skills, volunteer options, and labor market information. According to staff, the initial workshop (which occurred during the study period) had low attendance. Staff were not able to deliver the workshop as planned (e.g., no group dynamic) but used the opportunity to pilot the material.

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[52] In Year 2 of the program, the program had a waitlist for scholarships. This was due to a combination of factors: PCC was awaiting approval of Year 1 carryover funds and there were more Year 1 participants than expected and many were still in training in Year 2. As a result, some Year 2 treatment group members relied entirely on Pell grants and WIA funds.

[53] The academy was based on a model PCOS used with clients who were homeless.

Finally, PCOS designed the **New Employee Transition** program to encourage employers to hire Pathways to Healthcare graduates.[54] For interested employers, PCOS entered into a contract to fund training for the new employees to help them acclimate to their new workplaces. PCOS has a menu of training options, such as "soft skills," though training can be employer specific (e.g., skills needed for job retention). This was the latest offering to be launched, and at the end of follow-up for this report, PCOS was still recruiting companies.

- ***PCC launched the Student and Alumni Network to help program participants develop a professional network, build a sense of community, and foster college success skills.***

When designing the Network, PCC staff convened monthly meetings with a committee that included program participants in order to ensure it met students' needs. During this process, they learned that students were more interested in employment resources and college success skills than social events. Introduced in 2013, the Network offered a study skills workshop, as well as employment workshops on resume building, cover letters, interviewing, and job search strategies. According to Pathways to Healthcare staff, the Network's resume workshop was the most popular (see Exhibit 4-5). The program also implemented a Nursing Assistant resume workshop targeting students who were about to complete that program.

Another component of the Network was a LinkedIn group that encouraged professional networking among program participants and served as a platform for sharing program resources and announcements. Staff members provided examples of strong profiles and the "dos and don'ts" of profile pictures. PCC brought in a photographer to take profile pictures. At the time of the study's second site visit, the LinkedIn group had 131 members.

Finally, as part of the Network, Student Services staff conducted individual mock interviews, as well as provided cover letter and resume assistance as needed.

Exhibit 4-5. Student and Alumni Network's Resume Workshop

The workshop is a two-hour-long session where attendees build their resume using pathway-specific templates (e.g., Nursing). The templates are prepopulated with qualifications and job skills that map to the skills students learn in their coursework and are critical for professionals in that pathway. The workshop introduces students to the parts of a resume and to screening tools used by employers. Then one or more members of the Student Services staff assist students individually while they work on the computer. At the end of the session, students leave with a finished resume.

While the resume workshops were open to all Pathways to Healthcare program participants, the program is moving toward hosting pathway-specific workshops, facilitated by the SSS who advises the group.

4.4. Education and Training Participation Patterns

One of Pathways to Healthcare's central objectives was to increase participation in and completion of healthcare occupational training. This section analyzes rates and durations of participation in such training—and in remedial education via the bridge programs—for those assigned to the study's treatment group. The analysis, based on PCC program records, reports the overall level of participation, completion rates, and the duration of participation over the 18-month follow-up period.

[54] HPOG funds could be used for training but not wages.

- ***More than 60 percent of treatment group members received some form of education and training, and 48 percent enrolled in occupational training.***

Exhibit 4-6 shows the proportion of all study treatment group members who achieved key education and training milestones in the Pathways to Healthcare program. Out of all group members, 62 percent participated in any education or training activity, which could include the College Readiness class and/or open lab or an occupational training program. The remaining 38 percent did not participate in any of these activities after they were randomly assigned, although as discussed below, many of them did attend at least one advising session.

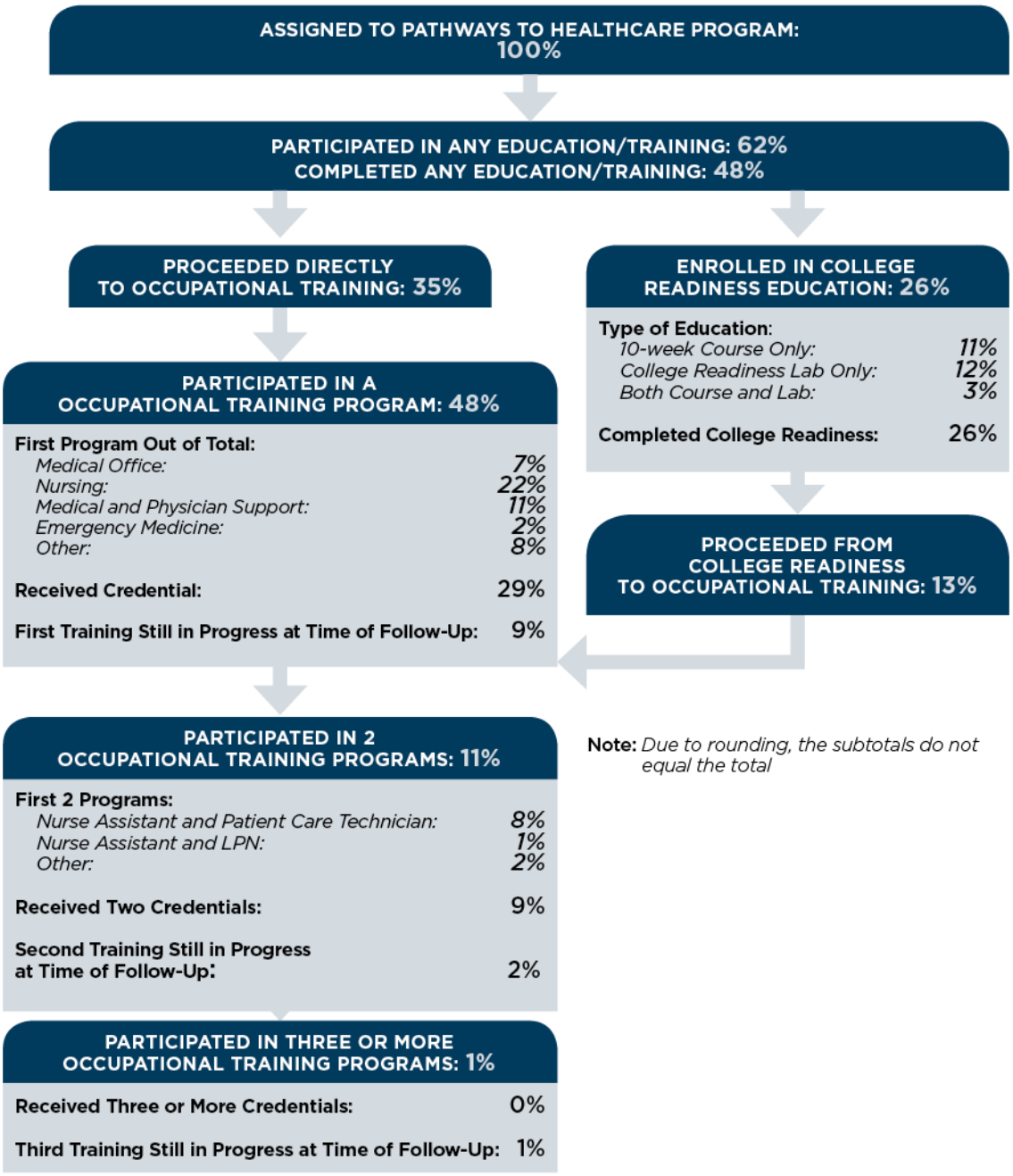
Twenty-six percent of treatment group members began with College Readiness—the 10-week class (11 percent), the open lab (12 percent), or both (three percent). All completed College Readiness, and 13 percent (half) proceeded to occupational training. Among College Readiness completers, the rate of continuation to occupational training varied by bridge: 55 percent of class completers versus 44 percent of the open lab completers (not shown). Thirty-five percent of individuals started in occupational training (i.e., did not attend a bridge program). Thus, on average, slightly less than half of all treatment group members (48 (35+ 13) percent) participated in occupational training within the 18-month follow-up period.

Among individuals who entered occupational training, the most common pathway was Nursing (22 percent of participants), followed by Medical and Physician Support (11 percent). By the end of the 18-month follow-up period, 29 percent received a credential and nine percent were still in their first training. Ten percent dropped out.

Eleven percent went on to attend a second occupational training during the follow-up period. Most of these (eight percent) participated in the Nursing Assistant and Patient Care Technician programs; one percent combined Nursing Assistant with Licensed Practical Nurse, and two percent combined other programs. In this second training, nine percent received a second credential and two percent were still in training at the end of the follow-up period. One percent participated in three or more occupational training programs.

Thus, evidence suggests that after 18 months, students in the study's treatment group made only modest progress along the occupational training pathways, with the exception of progression from Nursing Assistant to Patient Care Technician. As noted earlier, this was the one pathway step for which staff did not encourage participants to work before returning for a second training. About two-thirds of Nursing Assistant students immediately enrolled in the Patient Care Technician course.

Exhibit 4-6. Participation in and Completion of Education and Training among Treatment Group Members within an 18-Month Follow-Up Period



SOURCE: Pima Community College (PCC) records.

- ***Thirty-eight percent of participants did not enroll in education or training during the follow-up period.***

There are a number of possible reasons a large subgroup of participants did not engage in College Readiness or occupational training. It is possible that the length of time they had to wait for training may have deterred some from starting a program. Some may have determined that healthcare training was not a good fit after meeting with an advisor. Some may have started their pre-training paperwork and then failed to complete it (e.g., unsure how to navigate some of the steps, concern about steps such as fingerprint cards if an individual had a criminal record, simply got "bogged down" in the process). Finally, some may have found it difficult to juggle school with other commitments, particularly work.

The 15-month follow-up survey asked respondents who did not enroll to rank a number of possible reasons for their decision not to enroll as very important, somewhat important, or unimportant. For the subset of Pathways to Healthcare participants who did not enroll in training, the most common reasons reported as very important were not enough time for work (43 percent), not enough time for family (44 percent), and not enough financial aid (48 percent) (not shown).

Program staff members were aware of the large subgroup who did not participate and assigned a Transition Workgroup to explore how to engage them. The workgroup proposed implementing a Pathways to Healthcare group orientation to complement individual advising. The orientation as designed made clear the steps involved in the programmatic journey (including pre-training paperwork and other requirements), reiterated the supports available to participants and how to access them, and sought to build a sense of community among participants (this again drew on observations from the College Readiness class that social networking could bolster student engagement). The twice-a-month orientations were implemented late in program year four. While the orientation was not mandatory, advisors scheduled treatment group members for it during their random assignment appointment.[55]

The research team explored whether later cohorts of study participants who may have been exposed to the orientation engaged in College Readiness or training at higher rates. Specifically, the team compared the education and training enrollment rates for the first 150 participants randomly assigned to the treatment group and the last 150. Those randomly assigned at the end of the study enrolled at a slightly higher rate overall than did the early group (64 percent versus 61 percent). However, it is not clear that the new component was fully implemented at the time that random assignment concluded (February 2014).

- ***Nursing Assistant was the most commonly attended and completed training program.***

While Exhibit 4-6 showed the overall education and training participation for treatment group members, Exhibit 4-7 depicts attendance and completion rates and average length of time in a training course for the subset of treatment group members who participated in any education or training (i.e., of the 62 percent from Exhibit 4-6). For purposes of this analysis, completion refers to obtaining a credential.

[55] After PACE study enrollment ended, its random assignment appointment was replaced with a commitment appointment at which the advisor delivered the same message.

Exhibit 4-7. Type of Program Attended, Completion Rates, and Average Length of Stay among Treatment group Members in Pathways to Healthcare within 18-Month Follow-Up Period

Education and Training Program	Participation Rate	Of Participants in Specified Program		
		Completion Rate	Average Length of Stay (mos.)	Participating at End of Follow-Up
College Readiness	42.4%	99.4%	2.4	1.6%
Occupational Training	78.4%	59.9%	6.4	24.8%
College Readiness and Occupational Training	20.8%	47.4%	7.0	30.8%
Attended Any Program	100.0%	53.1%	6.0	19.5%
Occupational Training Programs				
Medical Office Pathway	11.5%	51.2%	6.4	14.0%
Medical Office (Level 1)	5.9%	63.6%		
Medical Records Technician (Level 2)	3.2%	66.7%		
Health Information Technology (Level 3)	2.4%	0.0%		
Nursing Pathway	35.7%	82.1%	3.2	15.7%
Nursing Assistant (Level 1)	29.9%	87.5%		
Patient Care Technician (Level 2)	16.0%	91.7%		
Licensed Practical Nurse (Level 3)	7.5%	28.6%		
Medical and Physician Support Pathway	17.6%	40.9%	10.5	43.9%
Phlebotomy (Level 1)	4.0%	80.0%		
Medical Assistant (Level 2)	11.7%	25.0%		
Clinical Research Coordinator (Level 3)	1.9%	28.6%		
Emergency Medicine Pathway	2.9%	45.5%	5.6	18.2%
EMT–Basic (Level 2)	2.9%	45.5%		
EMT–Paramedicine (Level 3)	0.0%	–		
Other Pathway	12.8%	41.7%	8.9	31.3%
Community Health Advisor (Level 1)	0.5%	50.0%		
Direct Care Professional (Level 1)	0.0%	–		
Behavioral Health Specialist (Level 1)	5.3%	55.0%		
Surgical Technician (Level 2)	1.3%	40.0%		
Pharmacy Technology (Level 3)	4.8%	16.7%		

SOURCE: PCC records.

NOTES: Sample size is 375 and includes all individuals who participated in at least one Pathways to Healthcare training course. Completion rate and length of stay are calculated for those who attended the specified program. Individual items may not sum to totals because participants can attend more than one training. Completion rate is defined as follows:

College Readiness: completed at least one College Readiness course/lab (among those who participated in at least one course/lab).

Occupational training: completed at least one occupational training (among those who participated in at least one occupational training).

College Readiness and occupational training: completed all College Readiness education and all occupational training attended (among those who participated in at least one College Readiness course/lab and at least one occupational training).

Attended any program: completed all training/education programs attended (among those who participated in at least one training program).

Occupational training pathways: completed all training programs attended within a particular pathway (among those who participated in at least one program within a particular pathway).

Individual occupational training programs: completed the occupational training program (among those who participated in the occupational training program).

More than one third (36 percent) of those entering occupational training attended the Nursing pathway; within this pathway, Nursing Assistant was the most common program (84 percent of those in the pathway and 30 percent of participants overall). As shown in Exhibit 4-6, of all participants, most who attended more than one training program did so within this pathway, with Nursing Assistant and Patient Care Technician being the most common. Overall, the Nursing pathway completion rate was 82 percent, driven largely by completion of the five-week Nursing Assistant program (88 percent) and four-week Patient Care Technician add-on (92 percent). The third program in the pathway, the 13-month, Level 3 Licensed Practical Nurse program, had a lower completion rate (29 percent) but a large proportion (54 percent) of participants were still enrolled at the end of the follow-up period (not shown).

The next most commonly attended pathway was Medical and Physician Support (about 18 percent of those who participated in any education or training). Within this pathway, the 15-month Medical Assistant program was the most common program. Its completion rate (25 percent) was lower than for other programs in the pathway, notably Phlebotomy (80 percent), but the duration of the program was longer and more students were still in training at the end of the follow-up period (not shown). This pathway had the largest share of participants still enrolled at the end of the follow-up period (44 percent).

Fewer treatment group members who enrolled in education or training attended programs in the Medical Office pathway (12 percent) or the Other pathway (13 percent).

- ***The average length of stay in a program was six months.***

Across all trainings (see the second-to-last column on Exhibit 4-7), treatment group members attended the Pathways to Healthcare program for an average of six months, with 53 percent completing the programs they were enrolled in and 20 percent still enrolled at the end of the follow-up period.[56] All who attended the College Readiness course or lab completed it by the end of the follow-up period, with an average length of stay of 2.4 months, about the time it would take to complete the class. In contrast, 60 percent of those who attended occupational training completed their program, in an average of 6.4 months; 25 percent were still in their training program at the end of the follow-up period.

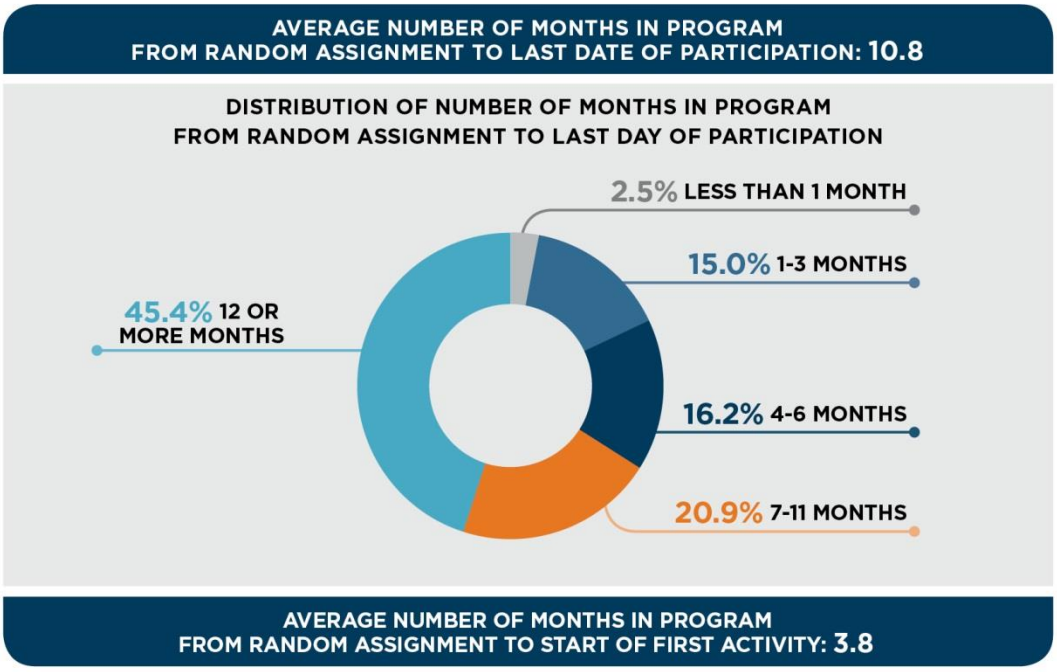
Reflecting different time commitments to complete the program requirements, there was considerable variation across the pathways in terms of length of time students spent in occupational training. As noted above, the average length of stay in the Nursing pathway was 3.2 months, reflecting the large share of study participants who enrolled in the Nursing Assistant training course. Of them, 16 percent were still in their pathway programs at the end of the follow-up period, the majority of whom were Licensed Practical Nurse students (71 percent). The Medical and Physician Support pathway and Other pathway (with most attending the Behavioral Health Specialist or Pharmacy Technology programs) both had longer lengths of stay (10.5 and 8.9 months, respectively).

[56] The length of stay was calculated for all participants, including those still in progress, and right-truncated at 18 months.

- ***On average, treatment group members spent four months waiting to begin their first education or training program.***

Each occupational training program involved upfront activities such as the training-specific passport (see Chapter 3). Treatment group members also worked with their advisors to create a Training Plan. Finally, depending on when a participant entered the Pathways to Healthcare program, he or she might have to wait for a class to start.[57] Exhibit 4-8 shows the average length of time in the program from the date of program enrollment (when random assignment was conducted) to the last date of training. The length of time from random assignment to the start of training averaged 3.8 months, indicating considerable time spent completing upfront activities and waiting for program activities to start. The exhibit also shows the average length of stay once in the program started was 10.8 months (3.8 months prior to starting plus an average of 7.0 months in education or training, including multiple trainings and intervals between), with more than 45 percent attending 12 months or longer.

Exhibit 4-8. Length of Stay in Pathways to Healthcare Program within an 18-Month Follow-Up Period



SAMPLE SIZE: N=375.
SOURCE: PCC records.

[57] Most training programs started twice per year, with the exception of Nursing Assistant and Patient Care Technician (every 5 to 6 weeks), LPN (every 10 weeks), Medical Assistant (quarterly), and Surgical Technician (once per year).

- ***Summary of participation findings.***

In summary, most treatment group members (62 percent) participated in Pathways to Healthcare College Readiness education and/or occupational training. Overall, 26 percent attended College Readiness, and 48 percent attended occupational training, which includes those who started directly in a training course (35 percent), as well as those who transitioned from College Readiness (13 percent). A sizable proportion of treatment group members, though, did not participate in Pathways to Healthcare. Some 52 percent did not enroll in occupational training during the follow-up period, including half of College Readiness completers; overall, 38 percent did not attend either College Readiness or a training program.

Of those who enrolled in occupational training programs, the largest share enrolled in the Nursing Assistant program (30 percent) and 88 percent completed it. By way of contrast, another commonly selected program, Medical Assistant, had a lower completion rate (25 percent) but more than 40 percent of students were still enrolled at the end of follow-up, owing in large part to the length of the program (15 months). Less than one-quarter (23 percent) of Pathways to Healthcare treatment group members participated in more than one program within the 18-month follow-up period (that is, moved along the pathway); the majority of those who did combined Nursing Assistant with Patient Care Technician.

The average treatment group member spent six months in any program, although the length of stay is truncated because 20 percent were still in their program at the end of the follow-up period. Students spent an average of 3.8 months completing their initial enrollment activities or waiting for their programs to start. As a result, the average length of time in a Pathways to Healthcare training course, from enrollment in the program (random assignment) until the last date of training, was about 11 months, with 45 percent of students engaged for 12 months or more.

4.5. Impact on Receipt of Services

This section focuses on the degree to which Pathways to Healthcare increased receipt of education and training, advising, and employment services. An implication of the career pathways framework is that any improvements in the main outcomes (discussed in Chapter 5) will result primarily from impacts on the treatment group's experiences and services tied to education and training.

The purpose of this section is to compare levels of education and training receipt across the treatment and control groups—that is, the service differential that is expected to lead to impacts. Analyses are based on experiences respondents reported in the follow-up survey. (Exhibit 4-9 below briefly explains how to read impact tables). Specifically, the following section discusses impacts on education or training receipt after random assignment (Exhibit 4-10) and receipt of advising and employment services (Exhibit 4-11).

Exhibit 4-9. How to Read Impact Tables

Exhibit 4-10 and Exhibit 4-11 as well as exhibits in Chapter 5 list the outcome measure in the analysis in the left-most column (Outcome), with the unit of that outcome in parentheses (e.g., "(%)").

The next column (**Treatment Group**) presents the treatment group's regression-adjusted mean outcome, followed by the control group's actual mean outcome (**Control Group**). The regression adjustments correct for random variation in baseline covariates between the two groups (and thus differ slightly from the raw means). The next column (**Difference**) lists the impact—that is, the difference between the treatment and control group means. The next column, **p-Value**, is the probability that observed or larger difference between the treatment and control group would occur by chance, even if there was no difference in the characteristics of the two groups.

There are several common standards for judging statistical significance. In this report, tests are considered statistically significant and highlighted in tables if the p-value is less than or equal to 0.10. Tests with smaller p-values are separately flagged:

- * for 0.10
- ** for 0.05
- *** for 0.01

The final column, **Standard Error**, is a measure of uncertainty in the estimated impact that reflects both chance variation due to randomization and any measurement error.

Outcomes in *italics* apply to a subset of survey respondents (e.g., those who attended education or training). These estimates are not impacts, but unadjusted, non-experimental comparisons.

Exhibit 4-10. Education or Training Receipt after Random Assignment

Outcome	Treatment Group	Control Group	Difference		Standard Error	p-Value
General Aspects of Education & Training Receipt						
Received education or training since random assignment (%)						
In any subject/field	60.1	46.9	+13.2	***	3.1	<.001
In a health occupation	37.4	30.2	+7.2	**	2.9	.015
Since random assignment, ever attended (%)						
Two-year college	50.0	34.9	+15.1	***	3.1	<.001
Four-year college	2.3	1.4	+1.0		0.8	.219
Proprietary school	2.6	7.8	-5.2	***	1.5	<.001
Adult high school/education	2.2	1.5	+0.7		0.9	.429
Community/non-profit organization	1.2	1.3	-0.1		0.7	.907
Other	4.3	3.0	+1.3		1.2	.280
Time spent at school and work at first place attended (%)						
Full-time school and full-time work	*13.6*	*8.6*	*+5.0*	*	*2.7*	*.066*
Full-time school with no or part-time work	*49.2*	*52.6*	*-3.4*		*4.4*	*.444*
Part-time school and full-time work	*11.8*	*15.2*	*-3.4*		*3.0*	*.260*
Part-time school with no or part-time work	*25.4*	*23.6*	*+1.8*		*3.8*	*.639*
Total	*100.0*	*100.0*				
Views of classes at first place attended (%)						
Strongly agrees relevant to life/career [a]	*56.6*	*59.4*	*-2.8*		*4.3*	*.512*
Used active learning methods most/all of the time [b]	*39.7*	*38.1*	*+1.6*		*4.3*	*.706*
Perceived strong emphasis on community at first place of instruction (%)	*12.9*	*19.8*	*-6.9*	**	*3.2*	*.035*
Basic Skills Instruction and Tests						
Received basic skills instruction since random assignment (%)						
Academic skills	18.0	10.3	+7.7	***	2.2	<.001
English as a Second Language	3.5	1.6	+1.9	*	1.0	.059

Outcome	Treatment Group	Control Group	Difference		Standard Error	p-Value
Took college placement exam (%)						
English	44.7	25.3	+19.4	***	3.0	<.001
Math	46.9	25.1	+21.8	***	3.0	<.001
Passed college placement exam (%)						
English	38.8	21.7	+17.2	***	2.9	<.001
Math	34.5	18.0	+16.5	***	2.8	<.001
Life Skills Instruction						
Received life skills instruction since random assignment (%)	16.2	15.6	+0.7		2.3	.779
Sample size (full survey sample)	500	477				

Covariate procedure used for these tables: Residualization.
*** indicates significance at the 99% level, ** at the 95% level, and * at the 90% level.
SOURCE: Abt Associates calculations based on data from Pima college records and the PACE short-term follow-up survey.
NOTES: Where not italicized, outcomes apply to the full survey sample, and impact estimates are fully experimental and regression-adjusted. Outcomes in italics apply to subset of survey respondents (e.g., those who attend education or training)—for these estimates, between-group differences are unadjusted, non-experimental comparisons.
Statistical significance levels, based on two-tailed t-tests of differences between research groups, are summarized as follows: ***statistically significant at the one percent level; ** at the five percent level; * at the ten percent level
[a] Percentages who either strongly agreed that classes were relevant to career interests or who strongly disagreed that classes did not relate to anything else in life.
[b] Refers to first place of instruction if went to more than one place. Gives the average percent who described classes as involving each of a series of active learning approaches at least often, or at least most of the time (items used different scales).

- ***Pathways to Healthcare had a statistically significant impact on education or training receipt.***

Exhibit 4-10 shows statistically significant impacts on study participants' receipt of education and training activities. The Pathways to Healthcare program produced a 13-percentage point difference in the proportion of treatment group members who received training in any subject compared with the control group (60 percent versus 47 percent) and a seven-point difference between the groups in receipt of healthcare-related training (37 percent versus 30 percent).[58] The lower levels of participation in healthcare training reflect that some students attended only the College Readiness bridges, or possibly participated in training in another field.

Reflecting that the program was operated at PCC, the Pathways to Healthcare program increased attendance among treatment group members at a two-year college by 15 percentage points (50 percent compared with 35 percent) and decreased attendance at a proprietary school by five percentage points (three percent compared with eight percent).

[58] These proportions represent the percentage of treatment and control group members who reported on the follow-up survey that they participated in an education or training program at PCC or elsewhere. While similar, this value differs from the proportion who participated in a program based on administrative data. This difference is due to variation in the data source (self-reported measures are subject to recall error). In addition, treatment group members who did not enroll in the Pathways to Healthcare program may have enrolled in other education and training programs in the community.

The program produced a statistically significant eight-percentage point difference in basic skills instruction (18 percent of treatment group members versus 10 percent of control group members). The Pathways to Healthcare College Readiness class and lab provided basic skills instruction, likely accounting for the difference. Reflecting that college entrance exams were required to participate in occupational training, there was a 19-percentage point difference in completion of a college placement exam in English (45 percent of treatment group members versus 25 percent of control group members) and a 22-percentage point difference in math (47 percent versus 25 percent). As well, treatment group members were significantly more likely to have passed a college placement exam than the control group ones.

Exhibit 4-10 also shows non-experimental comparisons for the subset of treatment and control group survey respondents who reported attending any training (see italicized rows). As shown, there are few statistically significant differences between the groups in time spent at school and work and view of classes at the first school attended. Treatment group members who received any training were more likely to report that they attended full-time school and worked full time (14 percent versus nine percent). Control group members were more likely to report there was a strong emphasis on community at their first place of instruction (20 percent versus 13 percent).

Exhibit 4-11 shows impacts on advising and employment services for all treatment and control group members, regardless of whether they received services or not (that is, for the total sample). Pathways to Healthcare had some impacts on advising and employment services, but they were not as large as education and training impacts.

The Pathways to Healthcare program had a nine-percentage point impact on receipt of career counseling (28 percent of treatment group members versus 19 percent of control group members), as well as a seven-percentage point impact on help arranging supports (14 versus seven percent) and a nine-percentage point impact on job search assistance receipt (23 versus 14 percent). Significantly fewer treatment group members (58 percent) cited financial support as a challenge to enrollment or persistence in the program than did control group members (69 percent).

Although these differences are statistically significant at the one percent level, the proportion of treatment group members who reported engaging in these services was low, particularly in light of the array of services available from the program. It is possible that students did receive the services, but that the survey wording did not resonate with them. For example, discussions about career options were embedded in many Pathways to Healthcare services, including WDS and SSAS advising and employment services; however, as “career counseling” was not a distinct program component, students may not have reported receiving it (and the same could be true for control group members).

Alternatively, because many services were voluntary, students may have opted not to use them. For example, those who did not have family or work barriers would not have needed help addressing them. Administrative data from the Performance Reporting System (available for the treatment group only) indicated 95 percent of treatment group members received academic advising/counseling (not shown). Considerably fewer, though, used other services: career counseling/job coach/navigator (20 percent), training-related supports such as books (29 percent) and uniforms and supplies (35 percent), and transportation assistance (12 percent).

Exhibit 4-11. Receipt of Various Supports since Random Assignment

Outcome	Treatment Group	Control Group	Difference		Standard Error	p-Value
Received assistance from any organization since random assignment (%)						
Career counseling	27.5	18.7	+8.7	***	2.6	<.001
Help arranging supports for school/work/family	14.0	7.3	+6.7	***	2.0	<.001
Job search or placement	23.3	14.1	+9.2	***	2.5	<.001
Received supports at first place of instruction attended (%)						
Career counseling						
Ever	*31.8*	*26.1*	*+5.7*		*3.9*	*.152*
Three or more times	*15.9*	*15.3*	*+0.6*		*3.2*	*.847*
Academic advising						
Ever	*48.2*	*42.6*	*+5.6*		*4.3*	*.193*
Three or more times	*29.6*	*24.0*	*+5.6*		*3.8*	*.142*
Financial aid advising						
Ever	*50.2*	*42.5*	*+7.8*	*	*4.3*	*.072*
Three or more times	*17.6*	*19.9*	*-2.4*		*3.4*	*.486*
Tutoring						
Ever	41.1	34.9	*+6.2*		*4.2*	*.140*
Three or more times	33.2	28.6	*+4.7*		*4.0*	*.247*
Help arranging supports for school/work						
Ever	13.3	7.4	*+5.9*	**	*2.6*	*.024*
Three or more times	7.9	4.8	*+3.1*		*2.1*	*.146*
Job search/placement assistance						
Ever	*28.2*	*19.8*	*+8.4*	**	*3.7*	*.023*
Three or more times	*13.8*	*9.6*	*+4.3*		*2.8*	*.129*
Received financial assistance at first place of instruction (%) [a]						
Grant/scholarship	*69.5*	*65.2*	*+4.3*		*4.1*	*.297*
Loan	*22.2*	*29.3*	*-7.1*	*	*3.8*	*.063*
Cited financial support as challenge in enrollment or persistence (%) [b]	57.5	69.3	-11.8	***	3.1	<.001
Offered opportunities for related work experience as part of training at first place of instruction (%)						
Clinical internship	*46.9*	*44.9*	*+2.0*		*4.4*	*.649*
Visits to local employer	*33.2*	*30.3*	*+3.0*		*4.0*	*.462*
Work-study job	*21.5*	*15.1*	*+6.3*	*	*3.3*	*.058*
Apprenticeship	*11.3*	*7.8*	*+3.5*		*2.5*	*.172*
Any related work experience (including other)	*63.5*	*59.3*	*+4.2*		*4.3*	*.327*
Sample size (full survey sample)	500	477				

Covariate procedure used for these tables: Residualization.

*** indicates significance at the 99% level, ** at the 95% level, and * at the 90% level.

SOURCE: Abt Associates calculations based on data from Pima college records and the PACE short-term follow-up survey.

NOTES: Where not italicized, outcomes apply to the full survey sample, and impact estimates are fully experimental and regression-adjusted. Outcomes in italics apply to subset of survey respondents (e.g., those who attend education or training)—for these estimates, between-group differences are unadjusted, non-experimental comparisons.

Statistical significance levels, based on two-tailed t-tests of differences between research groups, are summarized as follows: ***statistically significant at the one percent level; ** at the five percent level; * at the ten percent level

[a] Reported receiving grant or loan to help cover either tuition/school expenses or living expenses.

[b] Cited financial support challenges as a reason for non-enrollment or leaving school or as a difficulty while attending school.

Exhibit 4-11 also shows non-experimental comparisons for a subset of participants who received at least one service (see italicized rows). Significantly more treatment group members ever received help arranging supports (13 versus seven percent), although the proportion who received supports was low. Treatment group members also were significantly more likely to ever receive financial aid advising than were control group members (50 percent versus 43 percent). Additionally, the subset of treatment group members who enrolled in services was significantly more likely to report job search assistance than were their control group counterparts (28 percent versus 20 percent).

- ***Summary of Pathways to Healthcare impacts on education, training, and services.***

The Pathways to Healthcare program produced statistically significant impacts in the percentage of treatment group members who received training in any subject compared with the control group (13-percentage point difference) as well as the percentage who received healthcare-related training (seven-percentage point difference). Additionally, the program produced an eight-percentage point impact in the proportion of treatment group members who received basic skills instruction, a difference likely due to participation in the College Readiness class and lab. Treatment group members were significantly more likely to take and pass college entrance exams in English and math, both of which are required for enrollment in occupational training.

Pathways to Healthcare had smaller impacts on advising and employment services. These include career counseling (nine-percentage point impact), help arranging supports (seven-percentage point impact), and job search assistance (nine-percentage point difference). Although there were impacts in all three service areas, only a minority of treatment group members participated in these activities, ranging from 14 percent (supports) to 28 percent (career counseling). Fewer treatment group members cited financial support as a challenge to enrollment or persistence than did control group members.

5. Early Impacts of the Pathways to Healthcare Program

This chapter reports estimates of Pathways to Healthcare's early impacts on educational attainment, career progress, and a set of non-economic outcomes. The main estimates cover impacts over an 18-month period after random assignment for the full sample of 1,217 randomly assigned individuals. The research team also explored impacts for a longer follow-up period—30 months—for the two-thirds of the sample who enrolled through June 30, 2013 (and thus could be observed for a longer time).

The chapter begins by describing hypothesized impacts and outcomes analyzed. Subsequent sections present findings on education, career progress, and non-economic outcomes, respectively. In each case, subsections distinguish among confirmatory, secondary, and exploratory analyses.

5.1. Key Hypotheses and Outcomes

The Pathways to Healthcare program's designers sought to promote completion of training in growing healthcare fields through enhanced guidance and navigation through PCC's curriculum, complemented with enhanced basic skills remediation and other supports. In the theory of change, these strategies boost educational attainment through effects on skills (general 21st-century competencies and occupation-specific abilities), career knowledge, improved resources, and better means for coping with life challenges that can interfere with school and work.

The ultimate aim was to increase employment and earnings in middle-skill jobs in the healthcare sector. In theory, positive impacts on economic outcomes also should have positive effects on intermediate outcomes—such as career knowledge, work-related skills, self-esteem and other psycho-social factors, and life stressors.

The research team classified outcomes as primary, secondary, and tertiary, according to whether they addressed confirmatory, secondary, and exploratory hypotheses about Pathways to Healthcare impacts (see Chapter 2). Exhibit 5-1 lists and describes each outcome.

The primary outcome in the Pathways to Healthcare early analyses is hours of **occupationally focused college training**. College attainment is the primary mechanism for promoting career success in the program model. Though credential attainment and career track employment are ultimate goals, it seemed possible that 18 months would be too early for such impacts to emerge. In this light, hours of training completed appeared to be the most unambiguous single indicator of whether early impacts were on the right track. The measure includes both credit and non-credit (referred to as "clock hours") training, since the health pathways the program promoted included both.[59,60]

[59] Non-credit training does not include College Readiness class or lab or similar developmental education coursework.

[60] The team used PCC records to estimate impacts on total hours of training. Data the team collected from the National Student Clearinghouse showed that small fractions of the sample enrolled at other colleges besides PCC. For such sample members, the team imputed college outcomes from PCC records for statistically matched sample members. Appendix E provides a more detailed summary of the imputation process.

Secondary analyses included tests of hypotheses for additional education outcomes, as well as a number of indicators of early career progress. These hypotheses capture additional early effects suggested by the Pathways to Healthcare logic model and, as for the confirmatory hypothesis, have an expected direction. As Exhibit 5-1 shows, secondary outcomes include several sets of additional measures of educational and career progress.

Exhibit 5-1. Outcomes in the Impact Analysis

Outcome	Description	Data Source	Sample Size	
			Treatment	Control
Primary (Confirmatory Hypothesis)				
Hours of college training received	Hours for occupational non-credit and for-credit training (excluding College Readiness) Credits were converted into occupational training hours, and non-credit "clock hour" courses were converted into in-class hours	Pima College Records	609	608
Secondary (Secondary Hypotheses)				
Education				
Enrolled in college occupational training	Total enrollment in successive months following random assignment (1-6 months, 7-12 months, 13-18 months); any enrollment (Y/N)	Pima College Records	609	608
Hours of college occupational training	Total hours in successive months following random assignment (1-6 months, 7-12 months, 13-18 months); any hours (Y/N)	Pima College Records	609	608
Hours of occupational training by location	Total hours of training at a college, another location (e.g., community-based organization), any location	At college: Pima College Records	609	608
		At other location: PACE short-term follow-up survey	500	*477*
Credits earned from colleges by 18 months	Total college-level credits earned	Pima College Records	609	608
Credential receipt by location	Credential by the type of granting authority	At college: Pima College Records	609	608
		At other location: PACE short-term follow-up survey	500	477
Career Progress		PACE short-term follow-up survey		
Employment at or above a specified wage	Earning $12 or more per hour[a]		497	473
Employment in job requiring mid-level skills	Whether employed in a job requiring calibrated set of skills based on federal standards[b]		495	475
Working in a healthcare occupation	Whether employed in one of several healthcare occupational categories		495	475
Perceived career progress	3-item scale of self-assessed career progress; response categories range from 1=strongly disagree to 4=strongly agree		499	476
Confidence in career knowledge	7-item scale of self-assessed career knowledge; response categories range from 1=strongly disagree to 4=strongly agree		499	476

Outcome	Description	Data Source	Sample Size	
			Treatment	Control
Access to career supports	Six-item scale counting number of types of career-supportive relationships in workforce and education settings; response categories range from 1=no to 2=yes.		500	476
Tertiary (Exploratory Hypotheses)				
Psycho-Social Skills		PACE short-term follow-up survey		
Grit	8-item scale capturing persistence and determination; response categories range from 1=strongly disagree to 4=strongly agree		500	477
Academic self-confidence	12-item scale; response categories range from 1=strongly disagree to 6=strongly agree		500	477
Core self-evaluation	12-item scale; response categories range from 1=strongly disagree to 4=strongly agree		500	477
Social belonging in school	5-item scale capturing sense of belonging; response categories range from 1=strongly disagree to 4=strongly agree		499	477
Life Stressors		PACE short-term follow-up survey		
Financial hardship	2-item scale capturing financial hardship, reported as either an inability to pay rent/mortgage or not enough money to make ends meet; response categories are either 0=no or 1=yes		496	475
Life challenges	7-item scale capturing life challenges that interfere with school, work, or family responsibilities; response categories range from 1=never to 5=very often		499	477
Perceived stress	4-item scale capturing perceived stress; response categories range from 1=never to 4=very often		499	477

[a] Threshold selected because it was close to the 60th percentile of hourly wages among employed control group members.
[b] Skill levels based on the federal O*NET system with thresholds targeted to PACE program target occupations. Occupational categories were coded for PACE by Census Bureau staff from standard open-ended survey items.

Finally, tertiary outcomes provide additional evidence on program impacts, generally for outcomes of interest with some, though less certain, expectation for effects. The research team expected college experience, advising, and material supports to have positive effects on insights, habits, and functioning in a number of domains. As the exhibit shows, these outcomes include measures of a variety of psycho-social skills and life stressors.

5.2. Impacts on Educational Attainment

This section presents impact estimates for key measures of educational progress for the full Pathways to Healthcare sample and longer-term results for earlier sample cohorts with longer follow-up. To highlight the confirmatory test's special role as an indicator of whether early impacts are on track, this section first assesses findings on the primary outcome and then examines findings for secondary and tertiary outcomes.

- ***Pathways to Healthcare increased average total hours of college occupational training received (confirmatory hypothesis).***

The increase in hours of college occupational training for the treatment group suggests that Pathways to Healthcare's impacts were generally on the right track at 18 months. As Exhibit 5-2 shows, Pathways to Healthcare had a 63-hour impact on total hours of college occupational training, statistically significant at the one-percent level. Over an 18-month period, treatment group members attended 190 hours of college occupational training compared with 127 hours for the control group. The 127 hours for control group members primarily reflects the fact that they also had access to the occupational training courses of study. On average, a 63-hour increase over 18 months implies an average monthly increase of three to four hours per treatment group member. However, it is possible that this increase is distributed unevenly across the entire sample and, thus, is concentrated in certain segments of enrollees. Impacts on secondary outcomes in the next two panels of Exhibit 5-2 suggest that this is the case.

- ***The program also increased rates of college enrollment without reducing it in other institutions, as well as credential receipt, but not regular degree-applicable credits (secondary hypotheses).***

That impacts on hours arose strictly from increased enrollment is evident in comparing impacts on enrollment and average total hours. Pathways to Healthcare increased enrollment in college occupational training by approximately 20 percentage points during the 18-month follow-up period (56 percent versus 36 percent).[61] A closer look reveals that treatment/control group difference in total hours is driven entirely by increased enrollment: average hours per enrollee are very similar for the treatment and control groups (341 and 353 hours, respectively; slightly smaller for the former).[62] Hence, the overall impact of 63 hours results from Pathways to Healthcare's providing training to additional participants, rather than from increasing hours of participation among those enrolled. That this increase in participation was 20 percent of the sample suggests an increase of 320 hours of training for those in the treatment group who would otherwise not have enrolled in occupational training.[63]

In order to better examine the timing of these effects, the next two panels in Exhibit 5-2 also show that both the fractions enrolled in and the average total hours of college occupational training are higher for treatment than control group members in each of the first three six-month follow-up intervals after random assignment. Impacts on enrollment are smaller in the first six-month period (10 percentage points), grow in the next six months (18 percentage points), and remain positive in the last six months (15 percentage points). Impacts on average total hours of college occupational training follow a similar pattern (although treatment/control differences are not significant in the first period).

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[61] The 56 percent figure is higher than the number of individuals in Pathways to Healthcare that participated in occupational training in Chapter 4 (48 percent), primarily because the former includes occupational training in non-PCC institutions.

[62] Calculated by dividing each group's average total hours by its fraction ever enrolling. For example, for the control group: 127.0 hours / 36 percent enrolled = 352.8 hours per control group enrollee.

[63] Sixty-three hours / 19.7 percent = 320 hours.

Exhibit 5-2. Early Impacts on Education Outcomes (Confirmatory and Secondary Hypotheses)

Outcome	Treatment Group	Control Group	Difference		Standard Error	p-Value
Primary Outcome						
Total hours of college occupational training (average)	190.1	127.0	+63.1	***	15.2	<.001
Secondary Outcomes						
Enrollment in college occupational training in successive months after random assignment (%)						
Months 1-6	37.3	27.3	+10.0	***	2.6	<.001
Months 7-12	45.4	28.0	+17.5	***	2.6	<.001
Months 13-18	39.6	24.5	+15.1	***	2.6	<.001
Any month	55.8	36.0	+19.7	***	2.7	<.001
Total hours of college occupational training in successive months after random assignment (average)						
Months 1-6	56.4	49.1	+7.2		7.2	.156
Months 7-12	72.3	40.2	+32.1	***	6.2	<.001
Months 13-18	61.4	37.6	+23.8	***	6.4	<.001
All months	190.1	127.0	+63.1	***	15.2	<.001
Total hours of occupational training at (average)						
A college	190.1	127.0	+63.1	***	15.2	<.001
Another place	17.5	32.7	-15.2		8.2	.968
Any place	210.3	159.2	+51.1	***	17.6	.002
Total credits earned from colleges by 18 months	1.5	1.7	-0.2		0.3	.799
Received a credential from (%)						
A college	23.1	10.4	+12.7	***	2.1	<.001
Another education-training institution	2.1	9.0	-6.8		1.6	1.000
A licensing/certification body	24.1	22.5	+1.6		2.7	.282
Any source	34.6	29.4	+5.2	**	2.9	.040
Sample size[a]	609	608				

Covariate procedure used for these tables: Residualization.
SOURCE: Abt Associates calculations based on data from Pima college records and the PACE short-term follow-up survey.
NOTES: Statistical significance levels, based on one-tailed t-tests of differences between research groups, are summarized as follows: ***statistically significant at the one percent level; ** at the five percent level; * at the ten percent level.
[a] Sample sizes in this row apply to estimates based on college records for the full sample. In the last two panels (total hours and credentials by place), estimates for activity at a college are based on college records for the full sample, while all other estimates (including those for activity at any source) are based on the subsample who responded to the PACE follow-up survey, including 500 treatment and 477 control group members.

Possible explanations for growth in impacts in months 7–12 include increased enrollment by treatment group members completing Pathways to Healthcare's College Readiness program, time for academic planning and completion of the program-specific passports, and varying waiting times between the month of random assignment and when courses actually began. Such waits were substantial—averaging about four months, as documented in Chapter 4.

That enrollment impacts were still fairly strong in months 13–18 has important implications for the timing of any expected employment impacts. Notably, though some treatment group members may have completed training quickly and taken jobs, more remained in school than did their control group counterparts toward the end of the follow-up period. To the degree that positive impacts on employment follow program completion, any effects on the former will not be fully manifest until sometime beyond the 18-month follow-up period.

Insofar as it recruited from the general community and not just from students already committed to PCC, Pathways to Healthcare's positive college enrollment impact partly could reflect diversion from other types of training institutions, such as trade schools. However, findings show little evidence of diversion: the point estimate for impacts on hours of training at other places besides colleges is small (nine hours) compared with the average increase in hours (63 hours) and is statistically insignificant. The implication is that the Pathways to Healthcare increase in enrollment of 20 percentage points during the 18-month follow-up period was primarily new enrollment among a population that otherwise would not have received occupational training.

The vast majority of education and training both the treatment and control groups received appears to have been non-credit ("clock hour") instruction. Exhibit 5-2 shows that the average student earned less than two regular credits and that Pathways to Healthcare had no impact on this outcome.

The exhibit's last panel shows that the program more than doubled the fraction of participants earning college credentials. Nearly one-quarter (23 percent) of treatment group members, compared with only 10 percent of control group members, earned a credential, which is significant at the one percent level. As demonstrated in Chapter 4, the vast majority were short-term occupational certificates such as Nursing Assistant. The treatment group was also significantly more likely to earn a credential from any source (35 percent versus 29 percent, significant at the five percent level), including a college, another education and training institution and a licensing/certification body.

- ***Longer-term educational impacts for a cohort of early enrollees are generally encouraging (exploratory hypotheses).***

Availability of an additional year of college data for sample members enrolling by June 2013—two-thirds of the overall sample—enables analysis of a 30-month follow-up period. Such analyses are exploratory because longer-term impacts might differ for earlier and later enrollees within the overall sample.

Indeed, impacts during the first 18 months are smaller for earlier enrollees than are the corresponding estimates for the overall sample (Exhibit 5-3). Impacts in months 7-12 are 13 percentage points for enrollment in occupational training and 17 hours of occupational training among earlier enrollees, compared to the 17 percentage points and 32 hours seen in Exhibit 5-2 for the full sample. The differences imply that impacts are sharply higher among later enrollees. For example, separating the full sample into an early and late cohort shows that the enrollment impact at 7-12 months is 25 percentage points for later enrollees (not shown), compared with 13 points for earlier enrollees (Exhibit 5-3).

Larger impacts for later enrollees may indicate that the quality of Pathways to Healthcare's implementation had strengthened by the time later cohorts entered the program.

Impacts of Pathways to Healthcare on enrollment and hours between months 19 and 30 continue to be significantly positive, but diminish. In addition, the longer-term impact on college credential receipt—20 percentage points—is notably larger than the 13-percentage point impact at 18 months for the full sample (Exhibit 5-2). Given the earlier cohort's more modest impacts on enrollment and hours through 18 months, it is quite possible that later reports will find even larger longer-term credential impacts for the full sample.

Exhibit 5-3. Longer-Term Impacts (30 Months) on Selected Educational Outcomes for Earlier Enrollees (Exploratory Hypotheses)

Outcome	Treatment Group	Control Group	Difference		Standard Error	p-Value
Enrolled in college occupational training in successive months after random assignment (%)						
Months 1-6	34.9	30.4	+4.5		3.2	.153
Months 7-12	44.5	31.4	+13.1	***	3.2	<.001
Months 13-18	40.6	28.7	+11.9	***	3.2	<.001
Months 19-24	31.3	24.4	+6.9	**	3.0	.024
Months 25-30	23.3	18.5	+4.9	*	2.8	.077
Any month	60.0	43.4	+16.6	***	3.3	<.001
Total hours of college occupational training in successive months after random assignment (average)						
Months 1-6	46.9	62.7	-15.8	*	9.5	.097
Months 7-12	65.3	48.1	+17.1	**	7.8	.028
Months 13-18	62.6	44.7	+17.9	**	8.5	.035
Months 19-24	45.5	32.5	+13.0	*	7.2	.071
Months 25-30	30.3	16.0	+14.3	**	5.7	.012
All months	250.4	203.9	+46.5	*	25.6	.070
Received college credential (%)	37.3	17.7	+19.6	***	3.0	<.001
Sample size [a]	405	401				

Covariate procedure used for these tables: Residualization.

SOURCE: Abt Associates calculations based on data from Pima college records.

NOTES: Statistical significance levels, based on two-tailed t-tests of differences between research groups, are summarized as follows: ***statistically significant at the one percent level; ** at the five percent level; * at the ten percent level.

[a] Sample sizes in this row apply to estimates based on college records for sample members who underwent random assignment by June 2013.

The next scheduled report will analyze impacts over a 36-month follow-up period for the full sample. Because significantly more treatment than control group members remained enrolled in PCC at the end of the initial 18 months, employment impacts in the next section of this report do not necessarily provide a valid indication of potential longer-term results. With signs that enrollment impacts largely waned by 30 months, the 36-month, intermediate impact analyses will provide a less ambiguous basis for tests of employment and earnings impacts.

5.3. Impacts on Early Career Progress (Secondary Hypotheses)

This section presents impact estimates for six measures of career progress. Three indicators capture different aspects of self-assessed progress toward career goals: perceived career progress, confidence in career knowledge, and access to career supports. Three indicators describe employment outcomes: working in a job that pays at least $12 per hour, working in a job requiring at least mid-level skills, and working in a healthcare occupation.

The estimates in Exhibit 5-4 reveal positive impacts on two of the three indicators of self-assessed career progress. Impacts are largest for the index of perceived career progress. The difference of 0.12

points on a four-point scale (1 to 4) is significant at the one-percent level. In terms of effect sizes,[64] this difference amounted to an effect size impact of 0.17, larger than the effect sizes for the other statistically significant measure, access to career supports (0.13). Although statistically significant, it is not clear that these effects are large enough to be policy relevant. Further analyses with longer-term follow-up may clarify this.

Exhibit 5-4. Early Impacts on Selected Career Outcomes (Secondary Hypotheses)

Outcome	Treatment Group	Control Group	Difference	Standard Error	Effect Size	p-Value
Indices of Self-Assessed Career Progress (average)						
Perceived career progress [a]	3.37	3.25	+0.12 ***	0.05	+0.17 ***	.005
Confidence in career knowledge [b]	3.34	3.30	+0.04	0.04	+0.08	.125
Access to career supports [c]	1.71	1.67	+0.04 **	0.02	+0.13 **	.022
Indicators of Career Pathways Employment (%)						
Working in a job paying $12/hour or more [d]	23.5	26.9	-3.3	2.7	-0.08	.891
Working in a job requiring at least mid-level skills [e]	17.9	20.5	-2.7	2.5	-0.07	.857
Working in a healthcare occupation	16.4	16.8	-0.4	2.4	-0.01	.567
Sample size [f]	500	477				

Covariate procedure used for these tables: Residualization.
SOURCE: Abt Associates calculations based on data from the PACE short-term follow-up survey.
NOTES: Statistical significance levels, based on one-tailed t-tests of differences between research groups, are summarized as follows: ***statistically significant at the one percent level; ** at the five percent level; * at the ten percent level.
[a] Three-item scale tapping self-assessed career progress, response categories range from 1='strongly disagree' to 4='strongly agree.'
[b] Seven-item scale tapping self-assessed career knowledge, response categories range from 1='strongly disagree' to 4='strongly agree.'
[c] Six-item scale tapping self-assessed access to career supports, response categories range from 1='no' to 2='yes.'
[d] After assessing wage distributions for employed control members, we established this cut-point at approximately the 60th percentile of wages.
[e] Job is categorized as 3 or higher on five-item scale of required job skills, categories range from 1='little or no preparation needed' to 5='extensive preparation needed.'
[f] Sample sizes in this row apply to sample members responding to the PACE follow-up survey.

Results show no evidence of impacts for any of the three employment outcomes. The point estimates are all statistically insignificant. It is uncertain whether positive impacts on employment earnings will emerge in the longer term. That said, higher levels of college enrollment tend to initially reduce employment and thus make it less likely that early impacts on employment occurred in this initial 18-month analysis period, leaving open the possibility of positive impacts as treatment group members finish training in the longer term.

[64] An effect size is a standardized measure of the size of an effect that is defined as the impact divided by the pooled standard deviation of the treatment and control groups. Its purpose in this report is to express in a standardized manner the size of impacts that have no natural unit of measurement and to allow for comparison of the sizes of effects across scales.

That effects for perceived career progress are more positive than actual employment outcomes after 18 months is not surprising. While greater progress in training might foster an improved sense of career progress, that more treatment than control group members were enrolled in training programs at the end of the 18-month period implies suggests it is too early to expect unambiguously positive impacts on actual attainment of career-path jobs.

As noted in Chapter 4, program staff often encouraged students to "stop out" between training steps of a career pathway in order to get work experience. Lacking detailed job history data, the research team could not ascertain the degree to which such employment breaks occurred. However, findings in this section suggest any such stopping out was not substantial enough to produce positive employment impacts by the end of the 18-month follow-up period.

5.4. Impacts on Psycho-Social Skills and Life Stressors

Positive impacts on educational attainment and self-assessed career prospects create some possibility for positive effects on psycho-social skills associated with college success. Although the measures of psycho-social skills used in the follow-up survey are the result of fairly substantial testing, psychometricians lately have raised concern about their use in program evaluations. Specifically, individuals in a program that stresses these skills may come to have higher expectations of their performance than do control group members, and thus the treatment group members rate the same level of performance more negatively than do the control group (Duckworth and Yeager 2015). This potential for measurement biases injected some uncertainty about the direction of expected effects, such that the study treats these analyses as exploratory (i.e., subject to two-sided tests).

Results show no evidence of impact (Exhibit 5-5, top panel) for any of four indices of psycho-social skills tested. On its face, the program's enhanced counseling and supports, as well as material on "college success" skills woven into Pathways to Healthcare's College Readiness programs, favored positive psycho-social impacts. Successes in training also might improve self-assessments of personal qualities and capacities. On the other hand, the program's emphasis on psycho-social skills was not very intensive and explicit. Furthermore, Pathways to Healthcare's positive effects on education outcomes were limited to the approximately 20 percent of sample members who would not otherwise have been in college and perhaps were too modest in size to engender identifiable changes in dispositions across the full sample. Finally, there is the potential for measurement error, as described above.

In the longer term, Pathways to Healthcare may help to reduce financial and other life stresses by improving earnings and an array of skills for coping with stress. In the short term, earnings-related positive impacts are unlikely given the absence of employment impacts.

Although Pathways to Healthcare supports might help alleviate some pressures, members of the treatment group may have experienced higher levels of stress from striving to balance school with work and family responsibilities. Because of these potentially opposing influences, the research team classified hypothesized effects on stressors as exploratory in the early analysis. Results indicate no significant effects on several measures of stress (Exhibit 5-5, bottom panel).

Exhibit 5-5. Early Impacts on Other Outcomes (Exploratory Hypotheses)

Outcome	Treatment Group	Control Group	Difference	Standard Error	Effect Size	p-Value
Indices of Psycho-Social Skills (average)						
Grit [a]	3.20	3.17	+0.03	0.03	+0.07	.306
Academic self-confidence [b]	4.98	5.05	-0.07	0.05	-0.10	.136
Core self-evaluation [c]	3.37	3.34	+0.03	0.03	+0.06	.322
Social belonging in school [d]	3.38	3.40	-0.02	0.03	-0.04	.569
Indices of Life Stressors (average)						
Financial hardship [e]	0.62	0.59	+0.03	0.03	+0.06	.318
Life challenges [f]	1.57	1.53	+0.04	0.03	+0.09	.158
Perceived stress [g]	2.14	2.14	0.00	0.05	0.00	.951
Sample size [h]	500	477				

Covariate procedure used for these tables: Residualization.

SOURCE: Abt Associates calculations based on data from the PACE short-term follow-up survey.

NOTES: Statistical significance levels, based on two-tailed t-tests of differences between research groups, are summarized as follows: ***statistically significant at the one percent level; ** at the five percent level; * at the ten percent level.

[a] Eight-item scale capturing persistence and determination, response categories range from 1='strongly disagree' to 4='strongly agree.'

[b] Twelve-item scale capturing academic self-confidence, response categories range from 1='strongly disagree' to 6='strongly agree.'

[c] Twelve-item scale capturing core self-evaluation, response categories range from 1='strongly disagree' to 4='strongly agree.'

[d] Five-item scale capturing sense of belonging, response categories range from 1='strongly disagree' to 4='strongly agree.'

[e] One-item scale capturing financial hardship, reported as inability to pay rent/mortgage or not enough money to make ends meet, response categories range from 0='no' to 1='yes.'

[f] Seven-item scale capturing life challenges that interfere with school, work, or family responsibilities, response categories range from 1='never' to 5='very often.'

[g] Four-item scale capturing perceived stress, response categories range from 1='almost never' to 4='very often.'

[h] Sample sizes in this row apply to sample members responding to the PACE follow-up survey.

6. Conclusions

With its Health Profession Opportunity Grant, Pima Community College (PCC) and its partner, Pima County One-Stop (PCOS), aimed to increase the number of low-income Pima County residents enrolling in and completing healthcare occupational training. This chapter summarizes early findings at approximately 18 months following random assignment of the implementation and impact studies and describes implications for longer-term findings under the Career Pathways Intermediate Outcomes project.

6.1. Summary of Key Findings

Pathways to Healthcare program operators planned to enhance existing PCC and PCOS services to provide treatment group members (versus control group members) an integrated set of instructional, advising, and employment services. They designed the program to bundle 16 occupational training courses into five pathways and add two bridge components to help low-skilled participants improve their basic skills quickly. The program also sought to bolster advising by providing three distinct advisor roles to help program participants address academic and non-academic issues. Finally, the program aimed to link occupational training completers to employment.

From the Implementation Study

- ***Pathways to Healthcare's implementation generally occurred as envisioned.***

Implementation of the program largely followed the original design, although there were a number of adjustments to address challenges that arose. In terms of instruction, program staff members implemented the five pathways as well as the two accelerated and contextualized College Readiness bridges. However, although the original program design called for basing referral to the College Readiness course or open lab on a student's TABE score, advisors changed this strict rule in favor of a more flexible approach—they worked with students to determine which format was better suited to their schedule (e.g., day versus evening) and needs (e.g., how close the student was to reaching the desired ACT Compass score). PCC staff also designed and implemented instructional supports such as study groups and reading groups to address areas where program students appeared to struggle (e.g., mastering technical course content, improving reading skills).

Implementation of the program's **advising component** also aligned with the intended approach. Three advisors split responsibility for academic and non-academic advising. The two PCC advisors focused on the former both prior to program students' enrollment in occupational training (the SSAS) and following enrollment (the SSS). The PCOS advisor (the WDS) was the first point of contact and assessed students for potential barriers to participation, as well helped them start their Training Plan. So in practice, the advisors all assisted with academic issues, consistent with their specialized functions.

Employment services developed more than other program components over the course of the study. Largely based on internal workgroups and program participant feedback, the program developed three post-training workshops to help students search and interview for healthcare-related jobs. PCC staff also launched a networking group for program students to help them transition from training to employment.

- ***While most treatment group members received either academic remediation through College Readiness or training or both, a significant minority received neither.***

Some 62 percent of treatment group members participated in Pathways to Healthcare's College Readiness and/or occupational training, but a sizable proportion (38 percent) attended neither College Readiness nor occupational training. The program's design and implementation provides some possible explanations.

After enrollment, program students engaged with an advisor and explored healthcare occupations for which the program provided training; for example, visiting employers and observing workers. After undertaking this exploration, some enrollees may have decided they were no longer interested in an occupation in one of the 16 healthcare fields.

In addition, before program participants could enroll in College Readiness or occupational training, they had to complete a significant number of steps, which on average took several months. Possibly these multiple steps deterred those who were less motivated or had fewer resources with which to complete them.

Finally, it may be that for some program participants the barriers to education and training were greater than the program could overcome. Responses to the follow-up survey suggest this possibility. For the subset of Pathways to Healthcare participants who did not enroll in training, the most common reasons reported as very important were not enough time for work and for family and not enough financial aid.

- ***All program participants who enrolled in a bridge program successfully completed it, but only half subsequently enrolled in occupational training.***

About one-quarter of treatment group members enrolled in the College Readiness class or open lab, and all enrollees completed it. However, only half of these subsequently enrolled in occupational training.

It is unclear why half of those who completed one of the bridges did not enroll in occupational training. The program rules for completing College Readiness did not include a requirement to test high enough on the Compass to qualify for occupational training, and possibly some bridge completers did not. It could also be that some bridge completers opted for other forms of training once they completed College Readiness. Finally, survey respondents who completed College Readiness, but did not continue to occupational training provided similar reasons—including not enough time for work and family, and insufficient financial aid.

- ***Some 48 percent of treatment group members enrolled in occupational training; Nursing Assistant was the most common program.***

Overall, 48 percent of treatment group members enrolled in occupational training (35 percent who enrolled directly in training and 13 percent who started in College Readiness and transitioned). The most common pathway was Nursing (36 percent of enrollees), and the most common course within the pathway was the Level 1 Nursing Assistant program (84 percent of those in the Nursing pathway). The completion rate for the Nursing pathway was relatively high, at 82 percent, with students attending three months on average. More than 87 percent of Nursing Assistant enrollees completed the training. The next most common pathway was Medical and Physician Support (18 percent of enrollees). The

largest share of students in this pathway (about 66 percent) enrolled in the Level 2 Medical Assistant program. Enrollees spent an average of 10 months in this pathway and a large share (44 percent) was still enrolled at the end of the follow-up period. Overall, one-quarter of those who enrolled in occupational training were still enrolled at the end of the 18-month follow-up period.

- ***Only a small proportion of treatment group members advanced from a Level 1 to a Level 2 training; most who did enrolled in Patient Care Technician training after Nursing Assistant training.***

Overall, about 22 percent of those who enrolled in occupational training participated in two or more training programs. Of those, 73 percent enrolled in both Nursing Assistant (5 weeks) and the Patient Care Technician add-on. This high proportion most likely is a result of two features of Pathways to Healthcare's design. First, students could complete the Patient Care Technician course in one month, whereas the other Level 2 courses ranged from five to 15 months. Second, with the exception of the Nursing Assistant to Patient Care Technician transition, the program required completers to work for at least six months prior to enrolling in the next pathway level to ensure that the occupation was a good fit.

In addition, treatment group members had to complete a number of pre-training steps prior to enrolling in occupational training or had to wait for their program to start. This resulted in an average program duration (from enrollment to the last date of training) of 11 months, with 45 percent of students engaged for 12 months or more.

From the Impact Study

- ***The program had statistically significant impacts on total hours of college occupational training. As the confirmatory hypothesis for early analyses of this program, the finding indicates that impacts were on the right track.***

Pathways to Healthcare had a 63-hour positive impact on total hours of college occupational training (190 hours compared with 127 hours for the control group). The increase in average hours of college occupational training is a result of the much higher proportion of treatment group members who participated in training (56 percent versus 36 percent for control group members), as the average hours for those who participated were very similar (341 hours for treatment group members versus 353 hours for control group members).

- ***Consistent with positive effects on the primary outcome, Pathways to Healthcare also had positive impacts on a number of secondary educational outcomes.***

Over the 18-month follow-up period, Pathways to Healthcare had significant positive effects on enrollment in college occupational training, hours of such training, hours of occupational training at any kind of institution, and receipt of a college credential. In the last six months of the follow-up period, 40 percent of treatment group members were enrolled in college occupational training compared with only 25 percent of control group members, suggesting that over time larger overall effects on credential receipt may occur.

- ***Within the period of the study, Pathways to Healthcare had limited impacts on career outcomes.***

The program produced statistically significant impacts on the proportion of treatment group members who received career counseling, help arranging supports, and job search or placement assistance relative to the control group. The proportions receiving each type of support were nevertheless low, ranging from 14 percent to 28 percent.

There were some impacts on early career progress (a secondary outcome). The research team found positive impacts on two indicators of self-assessed career progress, with the largest impact on perceived career progress. The results, however, show no evidence of impacts for any of the three indicators of employment examined.

- ***Analysis of outcomes for an early cohort of treatment group members suggests that positive effects on educational outcomes are likely to extend, and perhaps grow, beyond the 18-month follow-up period.***

The research team analyzed 30 months of follow-up PCC college records for approximately two-thirds of the full sample of study participants. For that subsample, Pathways to Healthcare had significant positive effects on enrollment in college occupational training, hours of such training, and receipt of college credentials. The effects on training were still significant in the last six months of follow-up.

At the time of the first follow-up period, program administrative data also indicated that a large majority of treatment group members who completed a training course completed only one; about three-quarters of the minority who did complete two, enrolled in two of the shortest programs—Nursing Assistant and Patient Care Technician. Given the delay between participants' random assignment into the study and starting a program, as well as the program's guidance to work for a period of time before returning for subsequent training, it is possible that over a longer period more participants will enroll in a second training program. The 36-month report will be an opportunity to assess whether participants are moving along a pathway.

6.2. Implication for Longer-Term Findings

This initial report on Pathways to Healthcare focuses on the implementation of the program and its early effects on the education and training outcomes of treatment group members. Based on the career pathways framework and the Pathways to Healthcare logic model, the expectation was that if the program was to achieve its goals, by 18 months after random assignment, there would be significant positive effects on college occupational training. The positive effects found on a variety of measures, including the primary measure of hours of college occupational training, suggest that the program was successful in achieving this initial goal. The program achieved this primarily by increasing the number of enrollees in occupational training.

This report has focused mainly on education and training impacts, with only limited analysis of employment and earnings. This relative emphasis of educational outcomes reflects expectations, per Pathways to Healthcare's theory of change, that many program participants would still be engaged in training at the end of 18 months. Continuing engagement in education proved to be the case, with substantial positive impacts on college enrollment in months 13-18. If the findings for the early cohort

hold true for the full sample, these employment-suppressing effects may continue (particularly if there is a large uptake of Level 2 training), albeit at a lower level.

The next report on Pathways to Healthcare will cover a 36-month follow-up period for the full research sample. It will provide a more systematic look at impacts on employment for a period when any such impacts can be expected to emerge. That report will examine a broad variety of employment outcomes, including average employment and earnings over successive follow-up quarters, job characteristics (e.g., occupation, hourly wage rate, receipt of fringe benefits, career progress). Thus, the report will begin to answer whether the occupational training gains that Pathways to Healthcare achieved after 18 months will translate into economic gains in the workplace in the longer term. In addition, estimation of the long-term effects of PACE programs at approximately 72 months after random assignment will be the subject of the Career Pathways Long-Term project.

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