PATIENT-CENTERED OUTCOMES RESEARCH TRUST FUND TRAINING PROGRAM EVALUATION REPORT

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Agency for Healthcare Research and Quality

Agency for Healthcare Research and Quality Patient-Centered Outcomes Research Trust Fund
Training Program Evaluation Report

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Acronyms

ACA	Patient Protection and Affordable Care Act of 2010
AHRQ	Agency for Healthcare Research and Quality
CER	Comparative Effectiveness Research
CIA	Clinical Investigator Award
CNCI	Category Normalized Citation Impact
DRE	Division of Research Education
EQ	Evaluation Question
FOA	Funding Opportunity Announcement*
HHS	U.S. Department of Health and Human Services
HSR	Health Services Research
LHS	Learning Health System
MSI	Minority-Serving Institution
NIH	National Institutes of Health
OEREP	Office of Extramural Research, Education, and Priority Populations
OMB	Office of Management and Budget
PA	Program Announcement
PCOR	Patient-Centered Outcomes Research
PCORI	Patient-Centered Outcomes Research Institute
PCORTF	Patient-Centered Outcomes Research Trust Fund
PCORTF–TP	Patient-Centered Outcomes Research Trust Fund–Training Program
PD	Program Director
PI	Principal Investigator
PO	Program Officer
PRA	Paperwork Reduction Act
PRO	Patient Reported Outcomes
PROD	Project Research Online Database
PSA	Physician Scientist Award
RFA	Request for Application
SWG	Stakeholder Working Group

**Please note: The "Funding Opportunity" (FOA) designation was in use for the duration of the PCORTF training mechanisms discussed in this report. The FOA designation changed to "Notice of Funding Opportunity" (NOFO) near the completion of this report.*

Funding Mechanism Glossary

The following table provides general National Institutes of Health (NIH) funding mechanism definitions for funding opportunities offered under the Agency for Healthcare Research and Quality (AHRQ) Patient-Centered Outcomes Research Trust Fund Training Program (PCORTF–TP). Please see Table 1 in this report for the analogous AHRQ-specific PCORTF programs that correspond to these funding mechanisms.

Activity Code	Category	Title	Description (Program Announcement [PA]/ Request for Application [RFA])
K01	Research Career Programs	Research Scientist Development Award – Research & Training	For support of a scientist, committed to research, in need of both advanced research training and additional experience. (PA-13-181)
K08	Research Career Programs	Clinical Investigator Award	To provide the opportunity for promising medical scientists with demonstrated aptitude to develop into independent investigators, or for faculty members to pursue research aspects of categorical areas applicable to the awarding unit, and aid in filling the academic faculty gap in these shortage areas within health profession's institutions of the awardee. (PA-13-180)
K18	Research Career Programs	Career Enhancement Award	Provides either full-time or part-time support for experienced scientists who wish to broaden their scientific capabilities or to make changes in their research careers by acquiring new research skills or knowledge. Career enhancement experiences supported by this award should usually last no more than 1 year. (PA-12-115)
K99	Research Career Programs	Career Transition Award	To support the initial phase of a Career/Research Transition award program that provides 1-2 years of mentored support for highly motivated, advanced postdoctoral research scientists. (RFA-HS-12-007 and RFA-HS-13-002)
R00	Research Projects	Research Transition Award	To support the second phase of a Career/Research Transition award program that provides 1-3 years of independent research support (R00) contingent on securing an independent research position. Award recipients will be expected to compete successfully for independent R01 support from NIH during the R00 research transition award period. (RFA-HS-12-007 and RFA-HS-13-002)
K12	Research Career Programs	Physician Scientist Award	For support to a newly trained clinician appointed by an institution for development of independent research skills and experience in a fundamental science within the framework of an interdisciplinary research and development program. (RFA-HS-12-001 and RFA-HS-13-008)
R24	Research Projects	Resource-Related Research Projects	To support research projects that will enhance the capability of resources to serve biomedical research. (PA-12-114)
R25	Research Projects	Education Projects	For support to develop and/or implement a program as it relates to a category in one or more of the areas of education, information, training, technical assistance, coordination, or evaluation. (RFA-HS-14-004)

Executive Summary

The mission of the Agency for Healthcare Research and Quality (AHRQ) is to produce evidence to make healthcare safer, of higher quality, more accessible, equitable, and affordable, and to work within the U.S. Department of Health and Human Services (HHS) and with other partners to make sure that the evidence is understood and used. Section 937 [42 U.S.C. 299b–37] of the Patient Protection and Affordable Care Act of 2010 (ACA) authorized AHRQ to develop the skills of researchers to build capacity for conducting future comparative effectiveness research (CER). With support from the Patient-Centered Outcomes Research Trust Fund (PCORTF), AHRQ established seven unique extramural training grant programs that supported Mentored Career Development, Research Infrastructure Capacity Building, and Research Education grant activities that support individual and institutional capacity building for conducting CER/PCOR.

AFYA Inc. and Clarivate Analytics conducted an independent assessment of this extramural research program that involved direct engagement with the AHRQ Division of Research Education (program office) and AHRQ PCORTF-supported training program award recipients and mentors. The primary objective of the evaluation was to assess the outputs and early outcomes of AHRQ's PCOR training, infrastructure development, and capacity building programs.

Methods and Analysis

Evaluation questions were developed to enable assessment of each training program's outputs and outcomes. A participatory, mixed-methods design was employed to conduct the PCORTF–TP evaluation. Data collection included administering online awardee/scholar and primary mentor surveys along with conducting key informant interviews and a focus group with program directors. AHRQ program staff and program awardee interviews helped to refine the evaluation design and logic model. Data collection was followed by descriptive and content analyses of administrative reports, bibliometric analysis of documents/publications resulting from PCORTF–TP, qualitative analysis of key informant interviews/discussions with grant program directors, and quantitative analysis of survey data provided by AHRQ PCORTF–TP K Awardees and K12 Scholars and their primary mentors.

Notable Training Program Findings

- **Institutional Mentored Career Development Award Program in PCOR (K12)**—The primary aim of this program was to support CER/PCOR training and development of postdoctoral and early career faculty in academic and applied settings. (**Respondents**: N=80 of 114 K12 Scholars; N=58 of 76 Primary Mentors)

Knowledge of CER/PCOR Methods & Approaches	76.3% of K12 Scholar respondents reported that at the start of their scholar appointment, they either had no knowledge about *CER* methods or were only somewhat knowledgeable about *CER* methods. Additionally, 78.8% of K12 Scholar respondents reported similarly about their knowledge of *PCOR* approaches.
	When asked to what extent the support they received during their scholar appointment had contributed to their knowledge and skills across a range of *CER* methods, the majority of K12 Scholar respondents (66.5%) indicated that it had contributed to a moderate or great extent across all of the methods, particularly integrating quantitative and qualitative data sources (83.8%) and identifying gaps in the literature (78.8%). Likewise, a majority of K12 Scholar respondents (81.3%) indicated that their appointment had contributed moderately or greatly to their knowledge of *PCOR* and skills to apply PCOR methods, especially engaging stakeholders in the formulation of research questions and the design of research projects (87.5%).
Mentoring Experience	The majority of K12 Scholar respondents were satisfied or very satisfied (77.5%) with the mentorship they received from their primary mentors.
	Nearly all K12 primary mentor respondents (96.6%) reported being satisfied or very satisfied with their mentoring experience.

Post-Appointment Funding	Since starting their K12 scholar appointment, 68.8% of K12 Scholar respondents indicated they have received 1 or more grants or contracts as program director/principal investigator (PD/PI) that build on their CER/PCOR research.
Publications Activity (All)	The first K12 cohort produced 66 publications (1,255+ citations); and the second K12 cohort produced 884 publications (10,272+ citations).

❖ **Individual Mentored Clinical Investigator Career Development Award Program in PCOR (K08)**—The primary aim of this program was to provide early career clinician researchers a mentored research experience in PCOR/CER. (**Respondents**: N=19 of 21 K08 Awardees; N=13 of 21 Primary Mentors)

Knowledge of CER/PCOR Methods & Approaches	89.5% of K08 Awardee respondents reported that at the start of their K08 award, they either had no knowledge about *CER* methods or were only somewhat knowledgeable about *CER* methods. Additionally, 84.2% of K08 Awardee respondents similarly reported about their knowledge of *PCOR* approaches.
	When asked to what extent the support they received during their K08 award had contributed to their knowledge and skills across a range of *CER* methods, the majority of K08 Awardee respondents (76.3%) indicated that it had contributed to a moderate or great extent across all of the methods, particularly integrating quantitative and qualitative data sources (100%), identifying gaps in the literature (100%), and using observational methods in the synthesis of CER (89.5%). Likewise, a majority of K08 Awardee respondents (90.8%) indicated that their appointment had contributed moderately or greatly to their knowledge of *PCOR* and skills to apply PCOR methods, particularly collaborating with other institutions or research centers (100%) and engaging stakeholders in the formulation of research questions and the design of research projects (94.7%).
Mentoring Experience	The majority of K08 Awardees respondents were satisfied or very satisfied (89.5%) with the mentorship they received from their primary mentors.
	92.3% of K08 Awardee primary mentor respondents reported being satisfied or very satisfied with their mentoring experience.
Post-Award Funding	Since starting their award, 63.2% of K08 Awardee respondents indicated they have received 1 or more grants or contracts as PD/PI that build on their CER/PCOR research.
Publications Activity (All)	K08 Awardees (21 awardees over 3-5 years) produced 416 publications (4,899+ citations).

❖ **Individual Mentored Research Scientist Career Development Award Program in PCOR (K01)**—The primary aim of this program was to provide support for intensive research career development for early career research investigators in academic or applied settings, leading to PCOR. (**Respondents**: N=5 of 8 K01 Awardees; N=5 of 8 Primary Mentors)

Knowledge of CER/PCOR Methods & Approaches	80.0% of K01 Awardee respondents reported that at the start of their K01 award they had either no knowledge about *CER* methods or were only somewhat knowledgeable about *CER* methods. Additionally, 60.0% of K01 Awardee respondents similarly reported about their knowledge of *PCOR* approaches.
	When asked to what extent the support they received during their K01 award had contributed to their knowledge and skills across a range of *CER* methods, the majority of K01 Awardee respondents (70.0%) indicated that it had contributed to a moderate or great extent across all of the methods, particularly conducting systematic literature reviews (100%), using observational methods in the synthesis of CER (100%), and using techniques to reduce confounding and potential bias inherent in observational studies (100%). Likewise, a majority of K01 Awardee respondents (90.8%) indicated that their K01 award had contributed moderately or greatly to their knowledge of *PCOR* and skills to apply PCOR methods, particularly engaging stakeholders in the formulation of research questions and the design of research projects (100%).
Mentoring Experience	100% of K01 Awardee respondents reported being either satisfied or very satisfied with the mentorship they received from their primary mentors.
	80.0% of K01 Awardee primary mentor respondents reported being satisfied or very satisfied with their mentoring experience; 1 reported being dissatisfied.
Post-Award Funding	Since starting their award, 40% of K01 Awardee respondents indicated they have received 1 or more grants or contracts as PD/PI that build on their CER/PCOR research.
Publications Activity (All)	K01 Awardees (8 awardees over 3-5 years) produced 115 publications (759+ citations).

- **Pathway to Independence in PCOR (K99/R00)**—This program aimed to facilitate the transition of outstanding postdoctoral candidates from mentored to independent research positions. The award contained two components: a mentored (K99) phase of 1 to 2 years and an independent (R00) phase with a duration of 3 years. (**Respondents**: N=6 of 9 K99/R00 Awardees; N=7 of 9 Primary Mentors)

Knowledge of CER/PCOR Methods & Approaches	83.3% of K99/R00 Awardee respondents reported that at the start of their award, they either had no knowledge about *CER* methods or were only somewhat knowledgeable about *CER* methods. Additionally, 4 of 6 K99/R00 Awardee respondents (66.7%) similarly reported about their knowledge about *PCOR* approaches.
	When asked to what extent the support they received during their K99/R00 award had contributed to their knowledge and skills across a range of *CER* methods, the majority of K99/R00 respondents (65.3%) indicated that it had contributed to a moderate or great extent across all of the methods, particularly using registries and data mining techniques (83.3%) and conducting subgroup analyses to determine which treatments and interventions work best for specific populations (83.3%). Likewise, a majority of K99/R00 Awardee respondents (75.0%) indicated that their award had contributed moderately or greatly to their knowledge of *PCOR* and skills to apply PCOR methods, particularly engaging stakeholders in the formulation of research questions and the design of research projects (83.3%).
Mentoring Experience	The majority of K99/R00 Awardee respondents were satisfied (83.3%) with the mentorship they received from their primary mentors.
	85.7% of K99/R00 awardee primary mentor respondents reported being satisfied or very satisfied with their mentoring experience.
Post-Award Funding	Since starting their award, 83.3% of K99/R00 Awardee respondents indicated they have received 1 or more grants or contracts as PD/PI that build on their CER/PCOR research.
Publications Activity (All)	K99/R00 Awardees (9 awardees over 5 years) produced 105 publications (1,291+ citations).

- **Research Career Enhancement Awards for Established Investigators in PCOR (K18)**—This program aimed to support established investigators to augment or redirect their research focus and to further develop their research expertise in PCOR methodologies. (**Respondents**: N=13 of 15 K18 Awardees; N=7 of 15 Primary Mentors)

Knowledge of CER/PCOR Methods & Approaches	76.9% of K18 Awardee respondents reported that at the start of their K18 award, they had either no knowledge about *CER* methods or were only somewhat knowledgeable about *CER* methods. Additionally, 76.9% of K18 Awardee respondents similarly reported about their knowledge of *PCOR* approaches.
	When asked to what extent the support they received during their AHRQ PCOR award had contributed to their knowledge and skills across a range of *CER* methods, the majority of K18 Awardee respondents (76.9%) indicated that it had contributed to a moderate or great extent across all of the methods, particularly designing pragmatic clinical trials (92.3%) and identifying gaps in the literature (92.3%). Likewise, a majority of K18 Awardee respondents (78.8%) indicated that their award had contributed moderately or greatly to their knowledge of *PCOR* and skills to apply PCOR methods, particularly engaging stakeholders in research project implementation (84.6%).
Mentoring Experience	100% of K18 Awardee respondents reported being either satisfied or very satisfied with the mentorship they received from their primary mentors.
	All K18 Awardee primary mentor respondents (100%) reported being satisfied or very satisfied with their mentoring experience.
Post-Award Funding	Since starting their award, 84.6% of K18 Awardee respondents indicated they have received 1 or more grants or contracts as PD/PI that build on their CER/PCOR research.
Publications Activity (All)	K18 Awardees (15 awardees over 6 months-2 years) produced 84 publications (1,134+ citations).

- **Infrastructure Development Program in PCOR (R24)**—This program provided support for development of PCOR capacity among institutions that have basic health services research capacity but need focused support to develop capacity to conduct and implement PCOR. (**Respondents**: N=7 of 7 Grantees)

Grantees reported several accomplishments, including the following:

- One grantee became an active center for PCOR, raising awareness of PCOR at their own and partner institutions, and developing researchers and enhancing the infrastructure for using large data sets.
- One grantee launched a PCOR Infrastructure Development program to conduct and expand PCOR in partnership with patients and healthcare delivery systems that better inform patient-centered healthcare decision making and healthcare systems design.
- One grantee secured over $60 million in funding.
- One grantee created a sustainable Patient Engagement Resource Center (PERC) and website and engaged over 400 patient advisors to support researchers and clinicians.
- R24 awardees/scholars (7 grantees and numerous participating scholars over 5 years) produced 336 publications (4,429+ citations).

❖ **Researcher Training & Workforce Development in Methods/Standards for Conducting PCOR (R25)**—This program provided training for researchers in methodologies for synthesizing or generating scientific evidence via basic, advanced, and experiential training opportunities. (**Respondents**: N=5 of 5 Grantees)

Grantees reported several accomplishments, including the following:

- One grantee developed a comprehensive basic and advanced training program to build capacity in PCOR at seven minority-serving institutions across the country.
- One grantee created a 48-module basic training series featuring a broad overview of the essentials of CER/PCOR for research in healthcare delivery for cancer care, including prevention, screening, diagnosis, cancer therapy, supportive care, survivorship, and end-of-life care.
- One grantee designed an experiential training program that combined in-person learning with asynchronous, online education.

Conclusion

Evaluation results suggest that AHRQ's PCORTF–Training Program has been successful at its core goal of increasing national CER/PCOR capacity. Since inception, the program has trained hundreds of early and mid-career researchers and scholars and supported increased institutional infrastructure for CER/PCOR. PCORTF grant funding has supported mentoring, collaboration, community engagement, and faculty recruitment. These activities have contributed to 1,990 publications to date (which have consistently achieved higher-than-global-average impact scores), tools to support shared clinical decision making, CER/PCOR training curricula, and memoranda of understanding with partners representing diverse stakeholders. PCOR K Awardees and scholars along with program mentors credit PCORTF support with cultivating trainees' career development as CER/PCOR-informed researchers, clinicians, and administrators. Another important outcome has been trainees' and institutions' success in obtaining additional funding to support their ongoing CER/PCOR work. Many scholars have subsequently expanded CER/PCOR capacity by becoming mentors themselves. Grantees report that participation in the PCORTF program resulted in ongoing institutional support for CER/PCOR; ongoing academic, clinical, and community partnerships; and ongoing collaborative networks. Funded projects have yielded valuable findings about comparative effectiveness, patient engagement, cultural competence, health equity, and health system transformation.

1. Introduction

Section 937 [42 U.S.C. 299b–37] of the Patient Protection and Affordable Care Act of 2010 (ACA) authorized the Agency for Healthcare Research and Quality (AHRQ) to develop the skills of researchers to build capacity for future comparative effectiveness research (CER), inclusive of training in patient-centered outcomes research (PCOR) methods. With support from the Patient-Centered Outcomes Research Trust Fund (PCORTF), AHRQ has developed training grant programs to build capacity to conduct CER by supporting training in the methods used to conduct such research.

1.1 Purpose of Evaluation

This AHRQ-funded evaluation formally evaluated the outputs and early outcomes of AHRQ's PCOR training and infrastructure capacity building programs. To this end, evaluation questions were developed to enable assessment of each training program's outputs and outcomes. The evaluation did not seek to compare outcomes across programs or relative to other comparable AHRQ-funded grant mechanisms.

Funding mechanisms for PCORTF-supported training programs represented three grant activity categories: **1) Career Development**: "K" funding for individual awardees (K01, K08, K18, K99/R00) and mentored institutional scholar appointees (K12) to undertake CER/PCOR methods training; **2) Research Infrastructure Capacity Building**: "R" funding for senior investigators to facilitate CER/PCOR infrastructure capacity building (R24); and **3) Research Education**: "R" funding for senior investigators to establish and implement CER/PCOR education programs for workforce development (R25). The evaluation addressed questions broadly organized by these funding mechanism categories (please refer to Table 1). Note that some evaluation questions were deemed applicable to more than one funding mechanism category given cross-cutting question themes of interest for those programs.

Table 1: PCORTF–TP Evaluation Questions

Career Development Programs (All K)	
EQ1	Scholar and Individual Investigator Development
	a. What is the nature of PCORTF–TP activities for scholar and individual investigator career development at each site and for each program, and collectively across all grantee institutions?
	b. What are key grantee outputs?
	c. What are key grantee outcomes, and how do these activities contribute to meeting the PCORTF–TP outcomes?
	d. Which activities for PCORTF–TP scholars/investigators have the greatest influence on intended outcomes (e.g., PCOR careers, future research, future funding)?
EQ2	What is the experience of grantees and participating scholars with PCORTF–TP activities, and how does their experience impact program outcomes?
Mentored Institutional, Research Infrastructure, Research Education (K12, R24, R25)	
EQ3	How have PCORTF–TP and partner institutions developed the capacity for PCOR training and mentoring, and in what ways is this sustainable?
EQ4	Institution-focused Grants
	a. What infrastructure changes/enhancements were, or are expected to be, most impactful in expanding PCOR capacity?
	b. What types of professional development/training activities within a given institution were, or are expected to be, most successful in expanding the methodological expertise of faculty/research staff in conducting CER?
	c. What infrastructure changes were most sustainable and/or allowed for continued/future development of PCOR capacity within the institution?
Career Development, Research Infrastructure, Research Education Programs (All K, R24, R25)	
EQ5	How have PCORTF–TP activities enhanced individual and institutional capacity to obtain CER/PCOR funding?
EQ6	How have PCORTF–TP investigators contributed to the PCOR field, including PCOR capacity, in the short term? How are these contributions expected to contribute to the field over the long term?
EQ7	Have grantees been effective at developing partnerships with organizations and stakeholders outside the grantee team and maintaining those partnerships in a sustainable way?
EQ8	How have PCORTF–TP training activities and projects addressed health equity issues?

1.2 CER/PCOR Training Program Portfolio

With PCORTF support for training programs beginning in fiscal year 2011, AHRQ established a number of research training programs to support individual and institutional capacity building for conducting CER/PCOR. The programs included institutional mentored career development award programs, infrastructure development grants to build capacity, mentored researcher training opportunities enabling transition to independence for junior investigators, retooling in comparative clinical effectiveness for mid and senior career researchers, and mentored research career development opportunities for early career clinical investigators and research scientists.

In all, AHRQ issued 80 unique grant awards via 8 distinct funding opportunities, with award start dates between 2012 and 2017. Award periods varied by program, ranging from 6 months up to 5 years. The Division of Research Education (DRE) within AHRQ's Office of Extramural Research, Education, and Priority Populations (OEREP) manages these programs. Table 2 lists these programs.

Table 2: AHRQ PCORTF–Training Programs

Training Program *Goal/Purpose*	Number of Awards
Grants for Institutions to Facilitate CER/PCOR Methods Training	
1. PCOR Institutional Mentored Career Development Program (K12) RFA-HS-12-001; Posted 2011 (2-year awards) *Build capacity in PCOR; train in methods to conduct PCOR; recruit from diverse backgrounds/disciplines. (Multiple Scholar Appointments)*	5
2. Institutional Mentored Career Development Award Program in PCOR (K12) RFA-HS-13-008; Posted 2013 (5-year awards) *Train researchers in academic and applied settings on the generation, adoption, and spread of new PCOR evidence. (Multiple Scholar Appointments)*	10
Grants for Individuals to Acquire & Apply CER/PCOR Methods Training	
3. Individual Mentored Clinical Investigator Career Development Award Program in PCOR (K08) PA-13-180; Posted 2013 (3- to 5-year awards) *Train clinical investigators in academic and applied settings on the generation and use of new PCOR evidence into clinical practice.*	21
4. Individual Mentored Research Scientist Career Development Award Program in PCOR (K01) PA-13-181; Posted 2013 (3- to 5-year awards) *Train researchers in academic and applied settings on the generation and use of new PCOR evidence into clinical practice.*	8
5. Pathway to Independence in PCOR (K99/R00) RFA-HS-12-007 and RFA-HS-13-002; Posted 2012 (K99 2-year awards→R00 3-year awards) *Transition postdoctoral candidates to tenured independent PCOR researchers.*	9
6. Research Career Enhancement Awards for Established Investigators in PCOR (K18) PA-12-115; Posted 2012 (6- to 24-month awards) *Build capacity of established investigators to conduct PCOR.*	15
Grants for Institutional Infrastructure and Workforce CER/PCOR Capacity Building	
7. Infrastructure Development Program in PCOR (R24) PA-12-114; Posted 2012 (5-year awards) *Build capacity among health services research institutions to conduct and implement PCOR.*	7
8. Researcher Training & Workforce Development in Methods/Standards for Conducting PCOR (R25) RFA-HS-14-004; Posted 2013 (up to 5-year awards) *Build PCOR workforce with experiential training on standard, innovative, and advanced methods for conducting PCOR. (Multiple Trainees)*	5

1.3 Training Program Features

Institutional Mentored Career Development Award Program in PCOR (K12)

Program Features: The primary aim of the K12 mechanism of the PCORTF-TP was to support the training and development of postdoctoral and early career faculty in academic and applied settings (e.g., the healthcare delivery system, State and local governments, health plans, and research networks) with regard to methods, theories, and concepts used to conduct CER/PCOR. The varied institutional programs combined didactic and experiential opportunities to build PCOR capacity.

Individual Mentored Clinical Investigator Career Development Award Program in PCOR (K08)

Program Features: The primary purpose of the AHRQ PCOR Mentored Clinical Investigator Award (K08) program was to prepare clinician scientists for careers applying complex CER methods to clinical and health systems PCOR issues, involving stakeholders, as appropriate, in the design, execution, and dissemination of the research. The program provided salary and research support for a sustained period of "protected time" (3-5 years) for individuals with clinical doctoral degrees.

Individual Mentored Research Scientist Career Development Award Program in PCOR (K01)

Program Features: The primary purpose of the AHRQ PCOR Mentored Research Scientist Development Award (K01) program was to prepare research scientists for careers applying complex CER methods to clinical and health systems PCOR issues, involving stakeholders, as appropriate, in the design, execution, and dissemination of the research. The program provided salary and research support for a sustained period of "protected time" (3-5 years) for individuals with research doctoral degrees.

Pathway to Independence in PCOR (K99/R00)

Program Features: The K99/R00 mechanism aimed to facilitate the transition of outstanding postdoctoral candidates from mentored to independent research positions. The award contained two components: a mentored (K99) phase of 1 to 2 years and an independent (R00) phase with a duration of up to 3 years. Awardees were required to select a mentor with a track record of funded research related to the selected research topic to provide mentoring and supervision. Activation of the R00 independent award phase was contingent upon K99/R00 awardees' securing an independent research position and AHRQ's approval.

Research Career Enhancement Awards for Established Investigators in PCOR (K18)

Program Features: The K18 mechanism of the PCORTF-TP aimed to support established investigators up to 50% effort across a 6-month to 2-year period, to augment or redirect their research focus and to further develop their research expertise in PCOR methodologies. K18 awardees were required to hold the rank of Associate Professor or Professor or the equivalent in non-academic settings.

K18 awardees were required to propose a career enhancement/development plan that: 1) had intrinsic research importance in the area of PCOR; 2) would serve as a suitable vehicle for learning the CER methodology, as well as theories and concepts needed for undertaking a research career in PCOR; 3) would ensure high research productivity; and 4) would sufficiently prepare candidates for PCOR research that is responsive to and involves stakeholders in the development of the research or in the dissemination and implementation of research findings.

Infrastructure Development Program in PCOR (R24)

Program Features: The primary goals of this PCOR training mechanism were to: (1) provide faculty/research staff with methodological expertise in CER through the conduct of research projects and other professional development activities and (2) strengthen the underlying institutional infrastructure needed to support PCOR.

The institutions of each R24 grantee started with some health services research (HSR) capacity but needed additional support for developing PCOR capacity through resources such as increased faculty skills, recruiting additional faculty, cultivating institutional support for CER/PCOR, developing

partnerships and stakeholder engagement, and increasing access to research resources such as proprietary data sets.

Researcher Training & Workforce Development in Methods/Standards for Conducting PCOR (R25)

Program Features: The education programs offered by the AHRQ R25 program directors provided training for researchers in methodologies for synthesizing or generating scientific evidence via basic, advanced, and experiential training opportunities. R25 program directors worked to develop a broad range of training activities and programs, from basic to advanced, to accommodate a range of researcher skill levels and needs. These grants supported the development of educational programs based at five institutions that leveraged internal and external partnerships and collaborations with a variety of health systems and institutions to develop a diverse collection of CER/PCOR training programs to increase workforce CER/PCOR capacity.

Basic training took the form of a series of innovative, didactic short courses, workshops, online training modules, or other approaches to learning. Advanced training involved establishing a methods learning collaborative to enable peer-to-peer education. Experiential training involved a year-long mentored opportunity to gain direct experience with applying CER/PCOR methods or standards to a systematic review or research problem. Further, each education program was expected to evaluate its outcomes, including its effects on CER/PCOR systematic reviews or original research, the scientific workforce, and the competencies acquired by program participants.

2. Evaluation Methodology

2.1 Evaluation Design Overview

A participatory, mixed-methods design was employed to conduct the PCORTF–TP evaluation. Data collection included administering online awardee/scholar and primary mentor surveys along with conducting key informant interviews and a focus group with program directors. AHRQ program staff and program awardee interviews helped to refine the evaluation design and logic model. Data collection was followed by descriptive and content analyses of administrative reports, bibliometric analysis of documents/publications resulting from PCORTF–TP, qualitative analysis of key informant interviews/discussions with grant program directors, and a quantitative analysis of survey data provided by AHRQ PCORTF–TP K Awardees and K12 Scholars and their primary mentors. A description of specific design and methods for each component follows.

2.1.1 Early Formative Research

PCORTF–TP Documentation Review

The purpose of this secondary data analysis was to develop a cohesive and comprehensive understanding of PCORTF–TP, and to support development of a program logic model. AFYA project staff reviewed all available project documentation and background materials regarding PCORTF–TP, including relevant authorizing legislation and stated requirements, all applicable Requests for Application and Program Announcements for each of the individual PCORTF–TPs and their stated aims, and materials related to PCORTF–TP identified on the AHRQ website.

Interviews with AHRQ Program Staff

AFYA Evaluation Team members conducted interviews with each AHRQ PCORTF–TP program officer (PO) and other relevant AHRQ program staff. The interviews gathered information to inform the

development and refinement of a PCORTF–TP logic model underlying the evaluation plan, including evaluation questions, metrics and their sources, methods, and tools used to collect data.

Logic Model Development

Using information collected in the formative phase of the project, AFYA, in close coordination with AHRQ, developed a comprehensive logic model of PCORTF–TP. Logic models, rooted in change theory, visually depict the cascading flow of relationships among resources invested in a program, the activities planned and carried out, and the results one aims to achieve. Activities result in varied outputs that, in turn, lead to short-, mid-, and long-term outcomes. The logic model was used to refine evaluation questions and to identify candidate metrics that are aligned with PCORTF–TP's intended outputs and outcomes.

2.1.2 Stakeholder Working Group

Following the development of the preliminary evaluation plan and draft logic model, AFYA, in conjunction with AHRQ staff, established and convened a seven-member Stakeholder Working Group (SWG) comprising awardee, scholar, and grantee representatives from each training program to help inform the development of an overall program logic model and evaluation design. AFYA convened the SWG in a webinar-based meeting to gather input from these PCORTF–TP participants and to finalize the logic model.

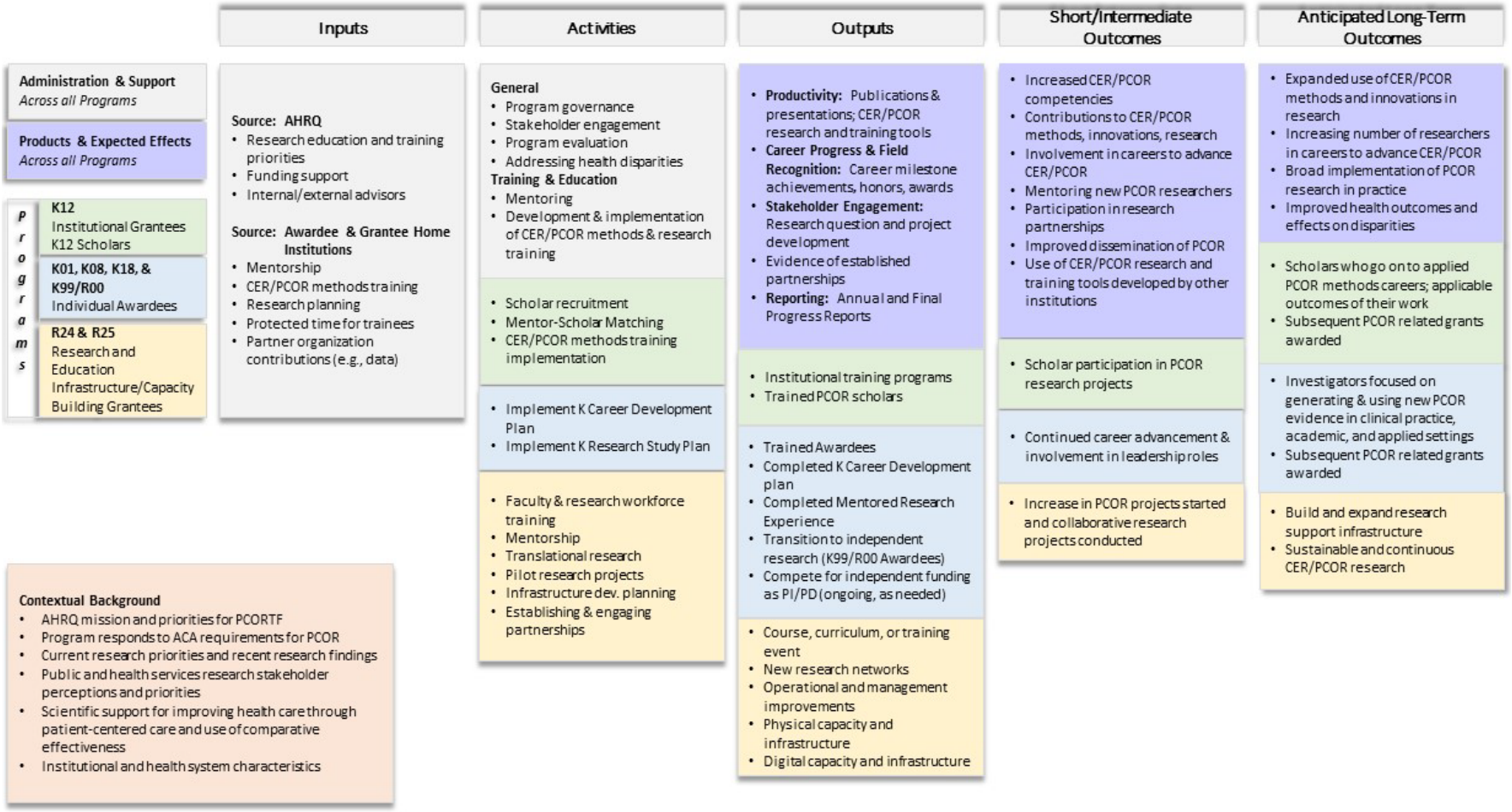
2.2 Logic Model

Figure 1 below provides a detailed logic model for PCORTF–TP based on AFYA's review of materials cited in the Statement of Work, consultation with AHRQ staff, and our understanding of the purpose of each training program. PCORTF–TPs include three distinct groupings of grants:

1. Institutional PCOR methodologic training (K12)
2. Individual researcher PCOR capacity building (K01, K08, K18, and K99/R00)
3. PCOR capacity building through infrastructure development and educational activities (R24 and R25)

While each group of grant programs has unique aims and approaches, all programs work toward the same goal—to build capacity for conducting CER/PCOR.

Figure 1: PCORTF–TP Logic Model



2.2.1 Evaluation Metrics

Deriving from the logic model in Figure 1, the AFYA team and AHRQ defined metrics and identified data sources to support the evaluation. These are listed in Table 3.

Table 3: Evaluation Metrics and Data Sources

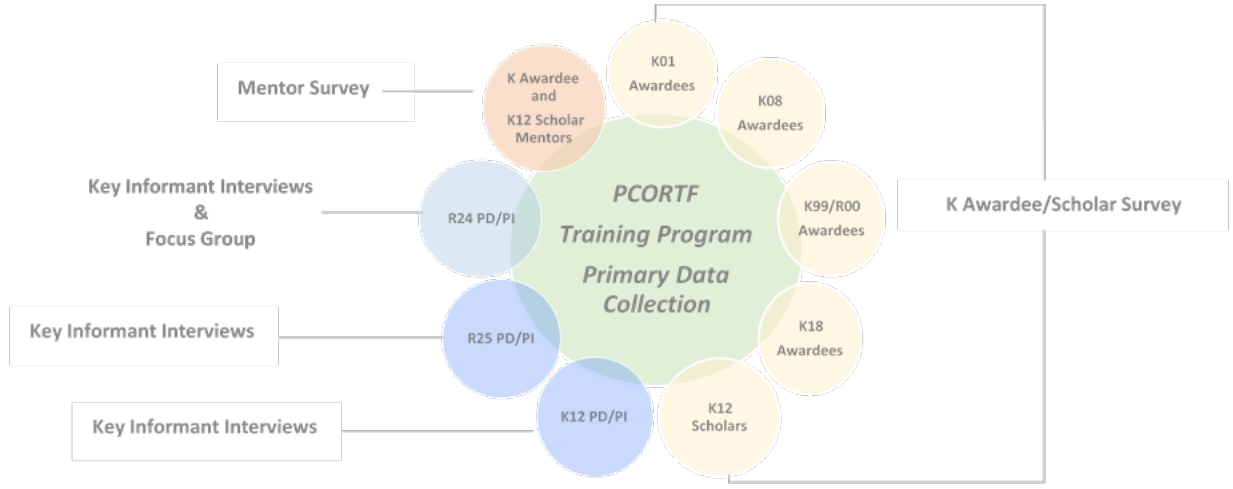
PCORTF–TP Programs & Participants	Measures	Data Sources
Grants for Institutions to Facilitate CER/PCOR Methods Training: **K12 Award (2-year, 5-year)** **Units of Analysis:** • **Scholar Appointees** • **Program Director Grantees** • **Primary Mentors**	• Number of scholars trained • Program characteristics • Publications, tools, and products • Proportion of research projects focused on health equity • Proportion of research projects engaging representatives of vulnerable communities • Number of scholars engaged in PCOR methods careers and outcomes of their work • Subsequent grants awarded	• AHRQ funding opportunity announcements (FOAs) • Grantee annual and final reports • Bibliometric analysis • AHRQ administrative databases, AHRQ PROD, and NIH Reporter • Surveys: PCOR K Awardee/Scholar Survey and Primary Mentor Survey • Key informant interviews
Grants for Individuals to Acquire & Apply CER/PCOR Methods Training: **K18, K99/R00, K08, K01** **Units of Analysis:** • **Awardees** • **Primary Mentors**	• Number of K Awardees trained • Project characteristics • Publications, tools, and products • Proportion of research projects focused on health equity • Proportion of research projects engaging representatives of vulnerable communities • Partnerships/collaborations • Continued pursuit of PCOR and related research; applicable outcomes of their work • Number of awardees who pursue PCOR at graduate and postgraduate levels • Subsequent PCOR-related grants awarded	• AHRQ FOAs • Grantee annual and final reports • Bibliometric analysis • AHRQ administrative databases, AHRQ PROD, and NIH Reporter • Surveys: PCOR K Awardee/Scholar Survey and Primary Mentor Survey • Key informant interviews
Grants for Institutional Infrastructure or Workforce Development CER/PCOR: **R24, R25** **Units of Analysis:** • **Principal Investigator Grantees**	• Number of participants in training programs and activities • Project characteristics • Publications, tools, and products • Partnerships/collaborations • Proportion of research projects focused on health equity • Proportion of research projects engaging representatives of vulnerable communities • Number of additional research projects started and collaborative research projects conducted • Infrastructure development • Sustainability planning	• AHRQ FOAs • Grantee annual and final reports • Grantee websites for program descriptions, products, and activities • Bibliometric analysis for impact assessments • Key informant interviews • Focus group (R24)

2.3 Data Collection and Analyses

To achieve the objectives of this program evaluation and address the evaluation questions, a mixed-methods data collection approach was employed that included secondary data collection activities,

bibliometric analysis, surveys, a focus group, and key informant interviews (Figure 2). A high-level overview of the methods for each are described in the subsections that follow.

Figure 2: Primary Data Collection



2.3.1 Quantitative Data Collection

K Awardee, K12 Scholar, and Primary Mentor Surveys

Two surveys were developed to gather data directly from individual K Awardees (K01, K08, K18, or K99/R00) and K12 Scholars ("K Awardee/K12 Scholar Survey"), and individuals serving as primary mentors ("Mentor Survey") to K Awardees/K12 scholar appointees. Survey instruments are presented in Appendices A and B. The surveys were submitted for Office of Management and Budget (OMB) Paperwork Reduction Act (PRA) clearance. Both surveys were created and web-enabled by AHRQ staff using a web-based tool that provides customizable surveys for AHRQ. Following OMB approval, the surveys were launched on May 20, 2020 (K Awardee/K12 Scholar Survey), and May 21, 2020 (Mentor Survey), and concluded on July 15, 2020. The response rates for both surveys were high at 73.7% and 70.1%, respectively.

Bibliometrics

Bibliometric analysis for this evaluation project was completed by AFYA in collaboration with Clarivate Analytics, which used two main datasets to gather publications, citations, and other relevant bibliometrics deriving from PCORTF–TP.

The first dataset was assembled by AFYA based on a review of annual and final reports for grantees funded under PCORTF–TP. This dataset of grantee-reported publications was collected in an EndNote file. This search includes documents published between 2011 and 2019. The second dataset was developed by Clarivate Analytics, which supplemented and expanded the first database using its Web of Science Core Collection. This search includes documents published between 2011 and the end of December 2020. The final PCORTF–TP publications portfolio includes all documents identified by both methods. Publications information is combined with PCORTF–TP grantee technical information, including grantee name, award duration, and grant number. It was analyzed in aggregate—where summarized data for all identified PCORTF–TP publications provide a top-level view of performance—and disaggregated by grant attributes in order to examine grant-level performance. The analysis was first conducted in July 2020, and then updated in March 2021 to capture publications through the end of

2020; the InCites dataset was updated on March 26, 2021, and includes Web of Science Core Collection content indexed through February 28, 2021, capturing publications through the end of December 2020.

The main indicators of research performance include number of publications, average Category Normalized Citation Impact (CNCI), and number and percentage of papers included in the top 10% of impact. Information from authors' affiliations (organizational collaboration, country of affiliation, international/industry affiliation) and publication metadata (journal, subject category, funding text) also were analyzed. Keyword and text analyses were performed for the title, keyword, and abstract data of collected publications. Finally, citation analysis was performed to identify citing patterns among PCORTF training programs.

2.3.2 Qualitative Data Collection

Key Informant Interviews

AFYA evaluators coordinated with AHRQ to develop interview questions relevant to the evaluation. The K12 interview guide (Appendix C) was submitted for OMB PRA clearance and received approval. The R25 and R24 interview guides (Appendix D and E, respectively) did not require OMB PRA review, as the number of R25 PD participants did not meet the review threshold. Individual key informant interviews were conducted with all seven R24 principal investigators (PIs), all five R25 PIs, and eight of 15 K12 PDs. Interviews were conducted via Zoom virtual meeting platform or over the phone, depending on individual participants' preference. Interviews lasted between 30 and 60 minutes, and averaged 45 minutes.

Focus Group

AFYA evaluators coordinated with AHRQ to develop focus group items relevant to the evaluation. A single focus group was conducted with all seven R24 PIs after the R24 PI key informant interviews were completed. The focus group was conducted via Zoom virtual meeting platform. The focus group lasted 1 hour. The R24 focus group discussion guide is included in Appendix F.

With participants' consent, the interviews and focus group were recorded to ensure accuracy of reporting. In all but one interview, one evaluator served as interviewer or discussion facilitator, while another evaluator took notes and asked follow-up questions. For each interview and for the focus group, the facilitator welcomed participants, provided a brief overview of the evaluation, and reminded participants of the purpose of the focus group prior to asking questions. Two evaluators summarized each interview and the focus group, then compared summaries. These evaluators reviewed responses, identified themes and main points, and developed summary reports.

3. Findings

3.1 PCORTF–TP Awardee Characteristics

3.1.1 Geographical Locations and Institutions of PCORTF–TP

CER/PCOR capacity building funding provided through the PCORTF–TP reached 56 different institutions across 26 States, including the District of Columbia, as shown in Figure 3. Table 4 below provides a high-level summary of PCORTF–TP awards by mechanism and awardee institution.

Figure 3: Geographical Spread of PCORTF–TP Awards

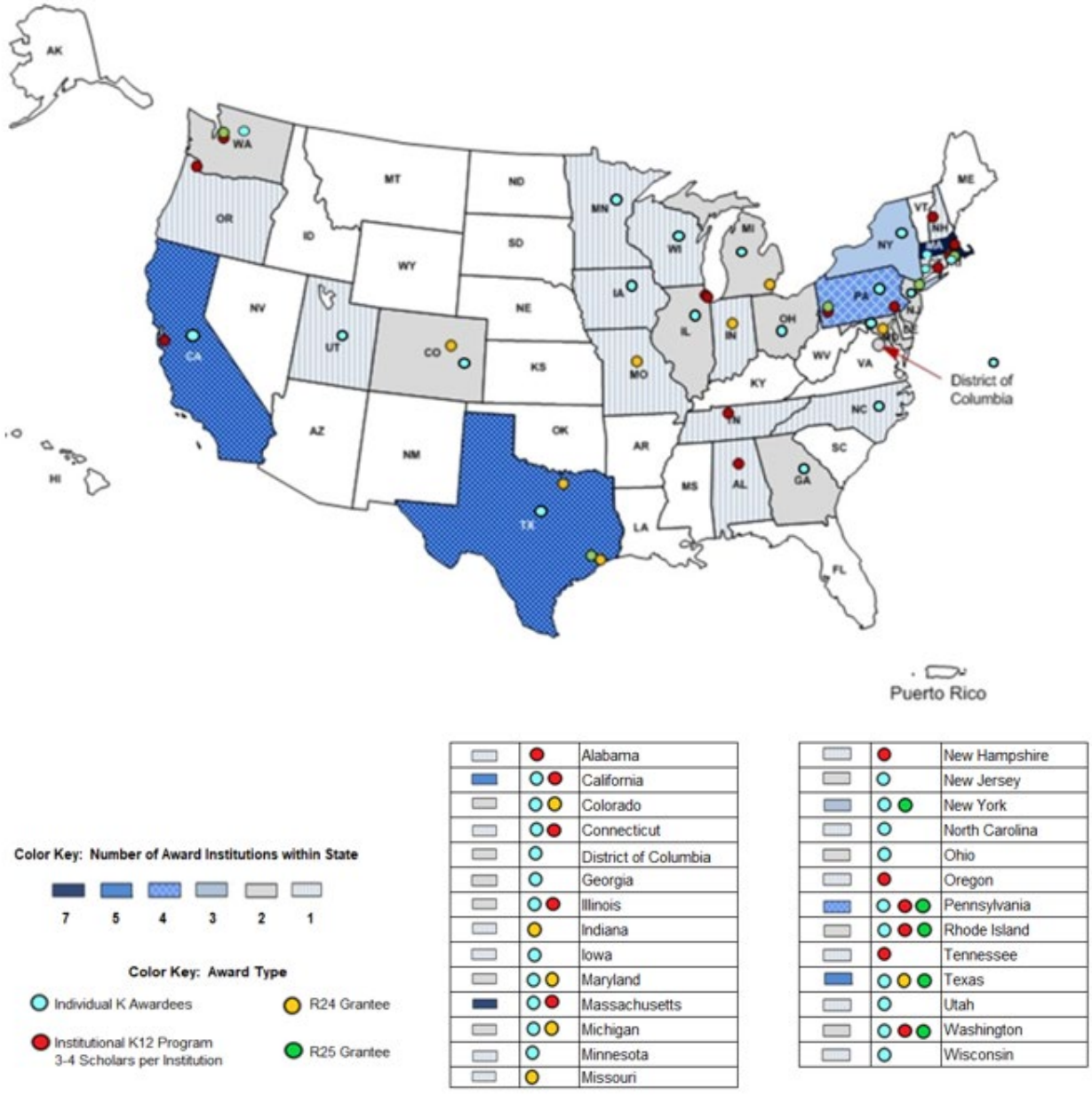


Table 4: Number of PCORTF–TP Awardees by Institution and Funding Mechanism

Institution	State	Congressional District	K08	K01	K18	K99 / R00	K12	R24	R25	Number of Awards
University of Alabama, Birmingham	AL	7	NA	NA	NA	NA	2	NA	NA	**2**
Palo Alto Medical Foundation Research Institute	CA	18	NA	NA	NA	NA	1	NA	NA	**1**
Rady Children's Hospital–San Diego (K99) / University of California, San Diego (R00)	CA	53 / 52	NA	NA	NA	1/1	NA	NA	NA	**1**
Stanford University (K99/R00)	CA	18	NA	NA	NA	1/1	NA	NA	NA	**1**
University of California, San Francisco (K99/R00)	CA	12	NA	NA	NA	1/1	NA	NA	NA	**1**
University of Southern California	CA	37	NA	1	NA	NA	NA	NA	NA	**1**
Denver Health and Hospital Authority	CO	1	NA	NA	NA	NA	NA	1	NA	**1**
University of Colorado, Denver (K99/R00)	CO	6	2	NA	NA	1/1	NA	NA	NA	**3**
Yale University	CT	3	1	1	NA	NA	1	NA	NA	**3**
Children's Research Institute	DC	98	1	NA	NA	NA	NA	NA	NA	**1**
Georgetown University	DC	98	NA	1	NA	NA	NA	NA	NA	**1**
Morehouse School of Medicine	GA	5	NA	NA	1	NA	NA	NA	NA	**1**
University of Iowa	IA	2	NA	NA	1	NA	NA	NA	NA	**1**
Northwestern University at Chicago	IL	7	NA	NA	1	NA	1	NA	NA	**2**
University of Chicago (K99/R00)	IL	1	NA	NA	NA	1/1	1	NA	NA	**2**
Indiana University–Purdue University at Indianapolis	IN	7	NA	NA	NA	NA	NA	1	NA	**1**
Beth Israel Deaconess Medical Center	MA	7	1	NA	NA	NA	NA	NA	NA	**1**
Boston Children's Hospital	MA	7	NA	NA	NA	NA	1/1	NA	NA	**1**
Brigham and Women's Hospital (K99/R00)	MA	NA	NA	NA	NA	1/1	NA	NA	NA	**1**
Dana-Farber Cancer Institute	MA	7	NA	1	NA	NA	NA	NA	NA	**1**
Harvard T.H. Chan School of Public Health	MA	7	NA	NA	1	NA	NA	NA	NA	**1**
Tufts Medical Center	MA	7	1	NA	NA	NA	NA	NA	NA	**1**
University of Massachusetts Medical School, Worcester	MA	2	1	NA	NA	NA	NA	NA	NA	**1**
Johns Hopkins University	MD	7	4	2	1	NA	NA	NA	NA	**7**
University of Maryland, Baltimore	MD	7	NA	1	NA	NA	NA	1	NA	**2**
Henry Ford Health System	MI	13	NA	NA	NA	NA	NA	1	NA	**1**
University of Michigan at Ann Arbor	MI	12	1	NA	NA	NA	NA	NA	NA	**1**
University of Minnesota, Twin Cities	MN	5	NA	NA	1	NA	NA	NA	NA	**1**

Institution	State	Congressional District	K08	K01	K18	K99 / R00	K12	R24	R25	Number of Awards
University of Missouri, Columbia	MO	4	NA	NA	NA	NA	NA	1	NA	**1**
Duke University (K99/R00)	NC	1	1		2	1/1		NA	NA	**4**
Dartmouth College	NH	2	NA	NA	NA	NA	1	NA	NA	**1**
Rutgers Biomedical and Health Sciences/ School of Health Related Professions	NJ	10	NA	NA	1	NA	NA	NA	NA	**1**
Albert Einstein College of Medicine	NY	14	NA	NA	NA	NA	NA	NA	1	**1**
University of Rochester	NY	25	NA	NA	1	NA	NA	NA	NA	**1**
Weill Medical College of Cornell University	NY	12	1	NA	NA	NA	NA	NA	NA	**1**
Cincinnati Children's Hospital	OH	1	2		1	NA	NA	NA	NA	**3**
Cleveland Clinic Foundation	OH	11	1	NA	NA	NA	NA	NA	NA	**1**
Oregon Health and Science University	OR	3	NA	NA	NA	NA	1	NA	NA	**1**
Pennsylvania State University Hershey Medical Center	PA	10	1	NA	NA	NA	NA	NA	NA	**1**
University of Pennsylvania	PA	3	NA	NA	2	NA	1	NA	NA	**3**
University of Pittsburgh at Pittsburgh	PA	18	NA	NA	1	NA	1	NA	1	**3**
University of Pennsylvania (K99)/Rutgers University (R00)	PA/NJ	3	NA	NA	NA	1/1	NA	NA	NA	**1**
Brown University	RI	1	NA	NA	NA	NA	1	NA	1	**2**
Women & Infants Hospital of Rhode Island	RI	2	NA	1	NA	NA	NA	NA	NA	**1**
Vanderbilt University	TN	5	NA	NA	NA	NA	1	NA	NA	**1**
Baylor College of Medicine	TX	9	1	NA	NA	NA	NA	NA	NA	**1**
University of Texas MD Anderson Cancer Center	TX	9	NA	NA	NA	NA	NA	NA	1	**1**
University of Texas Medical Branch at Galveston	TX	14	NA	NA	NA	NA	NA	1	NA	**1**
University of Texas Southwestern Medical Center	TX	30	NA	NA	NA	NA	NA	1	NA	**1**
Baylor Research Institute (K99) / Emory University (R00)	TX/GA	30 / 5	NA	NA	NA	1/1	NA	NA	NA	**1**
University of Utah	UT	2	1	NA	NA	NA	NA	NA	NA	**1**
Seattle Children's Hospital	WA	7	1	NA	NA	NA	NA	NA	NA	**1**
University of Washington	WA	7	NA	NA	NA	NA	2	NA	1	**3**
University of Wisconsin, Madison	WI	2	NA	NA	1	NA	NA	NA	NA	**1**
Total Number of awards by type			**21**	**8**	**15**	**9**	**15**	**7**	**5**	**80**

NA= Not Applicable

Note: K99/R00 column contains two values. The first value represents K99 and the second R00.

3.1.2 PCORTF–TP Response Rates by Funding Mechanism

Table 5 provides overall response rates for participants from the PCORTF–TP for specific primary data collection activities conducted as part this evaluation. Across all forms of primary data collection, participation as assessed by the response rates was generally high, even though all primary data collection was conducted during the 2020 coronavirus pandemic.

Table 5: Primary Data Collection Response Rates by PCORTF–TP Funding Mechanism

Funding Mechanism	Total Number	Primary Data Collection Method	Total Participants	Response Rate
K08	21	K Awardee/Scholar Survey	19	90.5%
K18	15	K Awardee/Scholar Survey	13	86.7%
K99/R00	9	K Awardee/Scholar Survey	6	66.7%
K01	8	K Awardee/Scholar Survey	5	62.5%
K12 (Scholars)	114	K Awardee/Scholar Survey	80	70.2%
All K Awards (Primary Mentors)	127	Mentor Survey	89	70.1%
K12 (PD/PI)	13	Interview	8	62.5%
R24 (PD/PI)	7	Interview Focus Group	7 7	100% 100%
R25 (PD/PI)	5	Interview	5	100%

Data Source: K Awardee/Scholar Survey

3.1.3 Survey Respondent Characteristics

The subsections below provide characteristics of respondents by AHRQ PCORTF–TP funding mechanism.

3.1.3.1 K Awardees and K12 Scholars

Career development awardees and scholars had a mix of credentials upon award (Table 6). K12 Scholars also reflected a mix of PhDs and MDs. With the exception of K18 awardees, K Awardees and K12 Scholars comprised early career scientists and clinician researchers (e.g., fellows, post-docs, and junior faculty). K18 awardees were more established investigators interested in augmenting or redirecting their research focus and further developing their research expertise in PCOR methodologies.

Table 6: K Awardee and K12 Scholar Academic Background

Funding Mechanism	Total Number	Awardee Degrees (Companion Credentials/Degrees)
K08	21	21 MDs (2 PhDs, 1 JD, 5 MPHs, 2 MOTHs, 2 OTHs)
K18	15	9 MDs; 6 PhDs (4 MPHs)
K99/R00	9	7 PhDs; 2 MDs (2 MPHs, 1 OTH [MSCE])
K01	8	7 PhDs; 1 SCD (1 MD, 2 MPHs, 1 MOTH [MHS])
K12 (Scholars)	114	Mix of PhDs, MDs, PharmDs

Data Source: K Awardee/Scholar Survey

Respondents of the K Awardee/K12 Scholar Survey were asked to describe their current professional title (Table 7) and how long they have been at their current primary institution/workplace. The majority of K Awardee/K12 Scholar respondents indicated that they held the title of assistant professor (38.2%) or associate professor (30.1%). Eight percent indicated that they were tenured professors, while 22% only identified institutional affiliations with no title or some other title. Close to 85% of respondents reported being at their current institution at the time of the survey for more than 3 years, with 60.2% being at their current institution for more than 5 years.

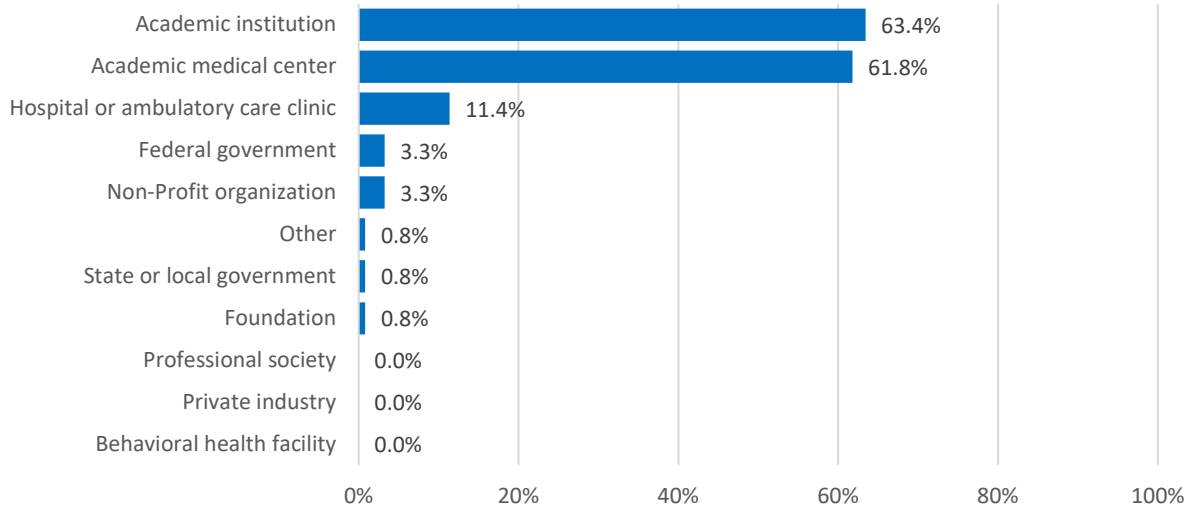
Table 7: K Awardee and K12 Scholar Titles

Professional Title of Current Position	Total Number	Percent of Respondents
Not Working	1	0.8%
Postdoc	1	0.8%
Assistant Professor	47	38.2%
Associate Professor	37	30.1%
Professor	10	8.1%
Other *(e.g., Research Scientist, Instructor, only Institutional Affiliation cited)*	27	22.0%

Data Source: K Awardee/Scholar Survey

K Awardees/K12 Scholars were also asked to describe the type of institution that serves as their current primary workplace. As shown in Figure 4, the vast majority of respondents (N=120; 97.6%) characterized their current primary work affiliations as academic institutions (N=78) and academic medical centers (N=76).

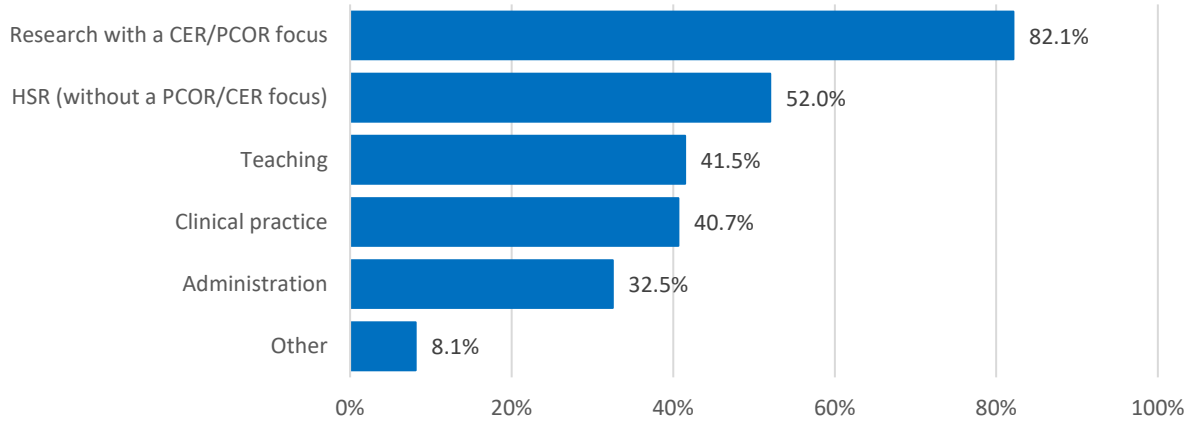
Figure 4: Current Primary Workplace at Time of Survey



Data Source: K Awardee/Scholar Survey

When asked about the focus of their current research and other job responsibilities (e.g., teaching, clinical practice, or administration), the vast majority of respondents (82.1%) indicated that they conduct research focused on CER/PCOR (Figure 5).

Figure 5: Current Work and Research Focus



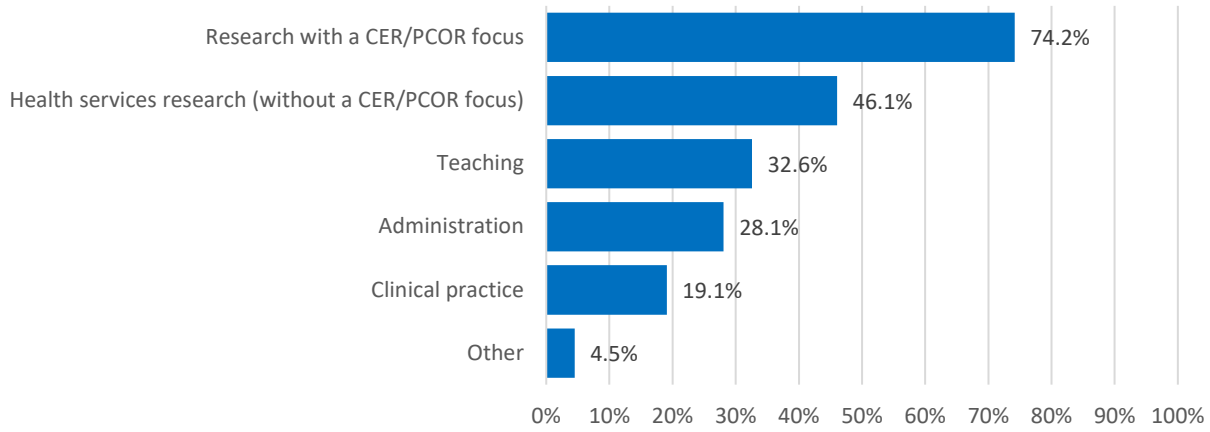
Data Source: K Awardee/Scholar Survey

3.1.3.2 Primary Mentors of K Awardees and K12 Scholars

Primary mentors of K Awardees and K12 Scholars held largely senior positions at their respective institutions. When asked to identify the title of their position at their primary institution, the vast majority (78.7%, N=70) of the respondents indicated that they were full professors or chairs/chiefs of specific departments, or deans at their institution. Five (5.6%) mentor respondents identified as more junior professors (i.e., assistant or associate). Eight (9%) described only their institution with no title, and two (2.2%) provided other types of titles (i.e., Board member; behavioral health scientist).

Primary mentors were also asked to describe their current work research focus and work responsibilities (Figure 6). Most mentors indicated that they currently conduct research and one or more other activities (such as teaching, clinical practice, or administration), with the average number of roles being 2 (median=1). Sixty-six respondents (74.2%) indicated that they conduct research focused on CER/PCOR.

Figure 6: Current Work and Research Focus



Data Source: Mentor Survey

Mentors were also asked to identify important factors involved in their decision to serve as a mentor under PCORTF–TP. The majority of respondents indicated that they wanted to increase the number of researchers (71.9%, N=64) or clinician-researchers (62.9%, N=58) with CER/PCOR expertise (Table 8). Sharing their own CER/PCOR expertise was also a common response (65.2%, N=58), along with improving individual (57.3%, N=51) and population-level (56.2%, N=50) health outcomes.

Table 8: Factors Involved in Deciding to Serve as a Mentor

Factors Influencing Decision to Mentor	N	Percent of Respondents
I want to increase the number of researchers with CER/PCOR expertise.	64	71.9%
I want to share expertise on CER/PCOR research methods.	58	65.2%
I want to increase the number of clinician-researchers with CER/PCOR expertise.	56	62.9%
I want to support improvement of individual health outcomes through CER/PCOR research.	51	57.3%
I want to support Improvement of population health outcomes through CER/PCOR research.	50	56.2%
I have observed less than adequate healthcare delivery systems that could be improved through CER/PCOR.	32	36.0%
I have observed less-than-adequate clinical practice that could be improved through CER/PCOR.	22	24.7%
I believe my own research has improved as a result of CER/PCOR training.	21	23.6%
I want to share expertise on communication that facilitates shared decision making.	18	20.2%
I want to share expertise on how health systems can facilitate shared decision making.	15	16.9%
I believe my own clinical practice has improved as a result of CER/PCOR training.	10	11.2%

Data Source: Mentor Survey

3.2 Results by Training Program Mechanism

The subsections below highlight evaluation findings across the different funding mechanisms of the PCORTF training programs.

Institutional Mentored Career Development Award Program in PCOR (K12)

Across the 15 K12 grantees, located at 13 distinct academic and applied institutions, a total of 114 scholars were appointed and trained over the course of 2 to 3 years. Scholars who were dedicated to pursuing careers in CER and PCOR were recruited through competitive application processes established at each of the institutions. Scholar recruitment processes varied by institution, but all fostered support of individuals from diverse and underrepresented groups in medical research. Selected scholars largely drew from the primary K12 grantee institutions, their respective local surrounding medical colleges, and other partner institutions.

Multidisciplinary faculty at each of the K12 institutions and faculty from surrounding partner institutions served as primary mentors and co-mentors to selected scholars. Faculty expertise to support didactic and experiential training encompassed a broad range of focus areas, including epidemiology and biostatistics, outcomes research, mixed-methods and observational research, pragmatic clinical trials, health information technology, stakeholder engagement and collaboration approaches, and implementation science, among other areas.

K12 Program Director Interviews

The K12 program often served as a "bridge" for junior researchers already affiliated with an institution to an individual career development award or training grant to complete the full 5 years of training typically required for transition to independence.

The pairing of mentors and scholars varied by institution, with most scholars selecting their mentor team, although approximately 20% of K12 Scholars had their mentors assigned by their respective program. Notably, K12 Scholars often reported that they had already started working with their primary mentors prior to their K12 scholar appointment (N=38, 47.5%). Selected scholars developed individualized training plans in conjunction with their mentors and K12 program directors, pursing a wide array of research interests.

Mentored research and research collaborations were the primary training modalities for K12 Scholars and across the K award training programs. However, other training modalities, including webinars, workshops, didactic coursework, and participation in community engagement activities, were also common. In particular, both workshops and coursework were relatively more common among K12 scholar programs.

Eighty of 114 K12 Scholars (70.2%) completed the K Awardee/K12 Scholar Survey; 59 of 80 K12 primary mentors (73.8%) completed the Mentor Survey; and 8 of 13 K12 program directors (62.5%) completed interviews.

Key Findings:

- **Scholar Appointment Completion Status:** Among the 80 K12 Scholars responding to the evaluation survey, 12 (15.0%) were still active in their scholar appointment. Of those remaining, 13 (16.3%) had completed their scholar appointment within the last year, 27 (33.8%) had completed it within the last 1-3 years, 20 (25%) had completed it within the last 3-5 years, and eight (10%) had completed it more than 5 years ago.
- **Initial CER/PCOR Knowledge Level:** At the start of their scholar appointment, 61 of 80 scholars (76.3%) reported having either no knowledge or being only somewhat knowledgeable about CER methods. The remaining scholars reported being more knowledgeable about CER. Similarly, 63 of 80 scholars (78.8%) reported having either no knowledge or being only somewhat knowledgeable about PCOR approaches.
- **CER/PCOR Knowledge/Skill Attainment:** When scholars were asked to what extent the support they received during their scholar appointment had contributed to their knowledge and skills across a range of CER methods, the majority (66.5% on average across all CER methods) of respondents indicated that it had contributed to a moderate or great extent across all of the methods, particularly integrating quantitative and qualitative data sources (83.8%) and identifying gaps in the literature (78.8%). Likewise, a majority of respondents (81.3% on average across all PCOR approaches) indicated that their appointment had contributed moderately or greatly to their knowledge and skills of PCOR methods, especially engaging stakeholders in the formulation of research questions and the design of research projects (87.5%).
- **Scholar Mentorship Satisfaction:** The majority of respondents were satisfied or very satisfied (N=62, 77.5%) with the mentorship they received from their primary mentors. Notably, 12 scholars (15.0%) reported being neutral with their mentorship experience, and four (5.0%) were either dissatisfied or very dissatisfied. This was unique to the K12 Scholars, as K Awardees under other mechanisms did not report any dissatisfaction.
- **Mentor Experience Satisfaction:** Nearly all responding K12 primary mentors (N=56, 96.6%) reported being satisfied or very satisfied with their mentoring experience. Only two (3.4%) reported a neutral experience.

Bibliometric Outcomes

- 1st K12 cohort (5 PD grantees and 15 scholars over 2 years) produced:
  - 66 publications
  - 1,255+ citations
- 2nd K12 cohort (10 PD grantees and 99 scholars over 5 years) produced:
  - 884 publications
  - 10,272+ citations

- **Achieving Goals:** In terms of achieving the goals of their K12 scholar appointment, 50 (62.5%) respondents reported they had either "exceeded" or "completely" achieved their short-term goals, while 21 (26.3%) had "mostly" completed their short-term goals. Likewise, 33 (41.3%) K12 Scholars reported having either "exceeded" or "completely" achieved their long-term goals, and another 29 (36.3%) had "mostly" completed their long-term goals.
- **Funding Success:** Since starting their K12 scholar appointment, 55 (68.8%) respondents indicated they have received one or more grants or contracts as PD/PI that build on their CER/PCOR research.
- **Research Career Outlook:** Among K12 Scholar respondents, 69 of 80 (86.3%) reported they were "very likely" to continue in a research career over the next 5 years. Another six (7.5%) reported they were "somewhat likely."

Commonly Cited Short- and Long-Term Goals Across K Awardees and Scholars

Short-term goals
- ❖ Secure research funding.
- ❖ Generate publications.
- ❖ Expand knowledge and skills related to CER and PCOR.

Long-term goals
- ❖ Advance research in CER/PCOR.
- ❖ Improve patient care.

Individual Mentored Clinical Investigator Career Development Award Program in PCOR (K08)

AHRQ funded 21 K08 individual mentored clinical investigator awards to provide support for a sustained period of protected time for intensive research career development for individual investigators in academic or applied settings, leading to research independence in the field of PCOR, as noted below. All 21 awardees held medical degrees (i.e., MDs), some with additional credentials (i.e., 2 PhDs, 1 JD, 5 MPHs, and 2 master's degrees [other degrees than primary]).

K08 awardees worked with primary mentors selected and named in their applications, and conducted mentored CER and PCOR research in a wide array of topic areas, including:

- ✓ Acute respiratory illness; neurologic impairment
- ✓ Adherence to quality care measures; palliative care
- ✓ Antibiotic prescribing
- ✓ Asthma; care transitions
- ✓ Children with medical complexity
- ✓ Colorectal cancer; irritable bowel syndrome
- ✓ Diabetes
- ✓ Food allergy
- ✓ Hidradenitis suppurativa
- ✓ Hospital admissions; pediatrics
- ✓ Inpatient consultation
- ✓ Palliative care; patient navigation
- ✓ Patient engagement
- ✓ Patient-perceived breakdowns in care and associated harms
- ✓ Pediatric liver transplant
- ✓ Pediatric obesity
- ✓ Pediatric patient safety; family engagement
- ✓ Pediatric sleep-disordered breathing
- ✓ Surgery
- ✓ Team primary care provision
- ✓ Ureteropelvic junction

Nineteen of 21 K08 awardees (90.5%) completed the K Awardee/K12 Scholar Survey; 13 of 21 K08 primary mentors (61.9%) completed the Mentor Survey.

Key Findings:

- **Award Completion Status:** Among the 19 K08 awardees responding to the evaluation survey, 10 (52.6%) were still active in their K08 award. Four (21.1%) had completed their award within the last year, and five (26.3%) had completed it within the last 1-3 years.

Bibliometric Outcomes

K08 awardees (21 grantees over 3-5 years) produced:
- 416 publications
- 4,899+ citations

- **Initial CER/PCOR Knowledge Level:** At the start of their K08 award, 17 of 19 awardees (89.5%) reported having either no knowledge or being only somewhat knowledgeable about CER methods. The remaining reported being more knowledgeable about CER methods. Similarly, 16 of 19 K08 awardees (84.2%) reported having either no knowledge or being only somewhat knowledgeable about PCOR approaches.
- **CER/PCOR Knowledge/Skill Attainment:** When K08 awardees were asked to what extent the support they received during their K08 award had contributed to their knowledge and skills across a range of CER methods, the majority (76.3% on average across all CER methods) of respondents indicated that it had contributed to a moderate or great extent across all of the methods, particularly integrating quantitative and qualitative data sources (100%), identifying gaps in the literature (100%), and using observational methods in the synthesis of CER (89.5%). Likewise, a majority of K08 respondents (90.8% on average across all PCOR approaches) indicated that their appointment had contributed moderately or greatly to their knowledge and skills of PCOR, particularly collaborating with other institutions or research centers (100%) and engaging stakeholders in the formulation of research questions and the design of research projects (94.7%).
- **Awardee Mentorship Satisfaction:** The majority of K08 respondents were satisfied or very satisfied (N=17, 89.5%) with the mentorship they received from their primary mentors. Only two K08 awardees (10.5%) reported being neutral with their mentorship experience.
- **Mentor Experience Satisfaction:** Twelve of 13 K08 awardee primary mentors (92.3%) reported being satisfied or very satisfied with their mentoring experience. One did not respond to this question.
- **Achieving Goals:** Among K08 awardees, 10 (52.6%) reported they had either “exceeded” or “completely” achieved their short-term goals, while eight (42.1%) had “mostly” completed their short-term goals. Likewise, eight (42.1%) reported having either “exceeded” or “completely” achieved their long-term goals, and another eight (42.1%) had “mostly” completed their long-term goals.
- **Funding Success:** Since starting their K08 award, 12 of 19 (63.2%) awardees indicated they have received one or more grants or contracts as PD/PI that build on their CER/PCOR research.
- **Research Career Outlook:** Among K08 awardees, 14 of 19 (73.7%) reported they were “very likely” to continue in a research career over the next 5 years. Four reported they were “somewhat likely.”

Individual Mentored Research Scientist Career Development Award Program in PCOR (K01)

AHRQ funded eight K01 individual mentored research scientist awards to provide support for a sustained period of protected time for intensive research career development for individual investigators in academic or applied settings, leading to research independence in the field of PCOR, as noted below. All eight awardees held research doctoral degrees (i.e., PhD and ScD), some with additional credentials (i.e., 1 MD, 2 MPHs, and 1 MHS).

K01 awardees worked with primary mentors they selected and named in their applications, and conducted mentored CER and PCOR research in a wide array of topic areas, including:

- ✓ Anticoagulants for atrial fibrillation (AF)
- ✓ Cancer (focus of 3 K01 awardees)
- ✓ Falls; hip fractures
- ✓ Kidney transplantation
- ✓ Labor induction
- ✓ Traumatic brain injury

Five of eight K01 awardees (62.5%) completed the K Awardee/K12 Scholar Survey; five of eight K01 primary mentors (62.5%) completed the Mentor Survey.

Key Findings:

Bibliometric Outcomes
K01 awardees (5 grantees over 3-5 years) produced:
- 115 publications
- 759+ citations

- **Award Completion Status:** Among the five K01 awardees responding to the evaluation survey, three (60.0%) indicated they were still active in their K01 award. Two (40.0%) had completed their award within the last 3 years.
- **Initial CER/PCOR Knowledge Level:** At the start of their K01 award, four of five awardees (80.0%) reported having either no knowledge or being only somewhat knowledgeable about CER methods. The remaining awardees reported being more knowledgeable about CER methods. Similarly, three of five K01 awardees (60.0%) reported having either no knowledge or being only somewhat knowledgeable about PCOR approaches.
- **CER/PCOR Knowledge/Skill Attainment:** When K01 awardees were asked to what extent the support they received during their K01 award had contributed to their knowledge and skills across a range of CER methods, the majority (70.0% on average across all CER methods) of respondents indicated that it had contributed to a moderate or great extent across all of the methods, particularly conducting systematic literature reviews (100%), using observational methods in the synthesis of CER (100%), and using techniques to reduce confounding and potential bias inherent in observational studies (100%). Likewise, a majority of K01 respondents (90.8% on average across all PCOR approaches) indicated that their appointment had contributed moderately or greatly to their knowledge and skills of PCOR, particularly engaging stakeholders in the formulation of research questions and the design of research projects (100%).
- **Awardee Mentorship Satisfaction:** All K01 respondents reported being either satisfied or very satisfied (N=5, 100%) with the mentorship they received from their primary mentors.
- **Mentor Experience Satisfaction:** Four of five K01 awardee primary mentors (80.0%) reported being satisfied or very satisfied with their mentoring experience. One reported being dissatisfied.
- **Achieving Goals:** Among K01 awardees who responded, three (60.0%) reported having either "exceeded" or "completely" achieved their short-term goals, while two (40.0%) had "mostly"

completed their short-term goals. Likewise, three (60.0%) reported having "completely" achieved their long-term goals, while two (40.0%) had "somewhat" achieved their long-term goals.

- **Funding Success:** Since starting their K01 award, two of five (40%) respondents indicated they have received one or more grants or contracts as PD/PI that build on their CER/PCOR research.
- **Research Career Outlook:** Among K01 awardees who responded, four of five (80.0%) reported they were "very likely" to continue in a research career over the next 5 years. One reported they were "somewhat likely."

Pathway to Independence in PCOR (K99/R00)

AHRQ funded nine K99/R00 individual Pathway to Independence investigator awards under two separate funding announcements. The K99/R00 mechanism aimed to facilitate the transition of outstanding postdoctoral candidates from mentored to independent research positions. The award contained two components: a mentored (K99) phase of 1 to 2 years and an independent (R00) phase with a duration of 3 years. Activation of the independent award phase was contingent upon the investigator's securing an independent research position, as noted below. All nine awardees held research doctoral degrees or medical degrees (i.e., 7 PhDs and 2 MDs), some with additional credentials (i.e., 2 MPHs and 1 MSCE).

K99/R00 awardees proposed a research project to pursue during the K99 phase and worked with primary mentors to conduct mentored CER and PCOR research during the R00 phase in a wide array of topic areas, including:

- ✓ Cancer; genetic testing
- ✓ Healthcare markets
- ✓ Hepatitis C
- ✓ Heterogeneity in treatment effectiveness
- ✓ Home healthcare
- ✓ Methods for comparative effectiveness and safety; atrial fibrillation (AF)/flutter
- ✓ Patient portals
- ✓ Shared decision making
- ✓ Surgical site infections; pediatrics

Six of nine K99/R00 awardees (66.7%) completed the K Awardee/K12 Scholar Survey; seven of eight K99/R00 primary mentors (87.5%) completed the Mentor Survey.

Key Findings:

- **Award Completion Status:** Among the six K99/R00 awardees responding to the evaluation survey, three (50.0%) indicated they had completed their award within the last 1-3 years, and three (50.0%) indicated they had completed their award within the last 3 years.

Bibliometric Outcomes
K99/R00 awardees (9 grantees over 5 years) produced:
- 105 publications
- 1,291+ citations

- **Initial CER/PCOR Knowledge Level:** At the start of their K99/R00 award, five of six awardees (83.3%) reported having either no knowledge or being only somewhat knowledgeable about CER methods. The remaining awardees reported being more knowledgeable about CER methods. Similarly, four of six K99/R00 awardees (66.7%) reported having either no knowledge or being only somewhat knowledgeable about PCOR approaches.
- **CER/PCOR Knowledge/Skill Attainment:** When K99/R00 awardees were asked to what extent the support they received during their AHRQ PCOR award had contributed to their knowledge and skills across a range of CER methods, the majority (65.3% on average across all CER methods) of respondents indicated that it had contributed to a moderate or great extent across

all of the methods, particularly using registries and data mining techniques (83.3%) and conducting subgroup analyses to determine which treatments and interventions work best for specific populations (83.3%). Likewise, a majority of K99/R00 respondents (75.0% on average across all PCOR approaches) indicated that their award had contributed moderately or greatly to their knowledge and skills of PCOR, particularly engaging stakeholders in the formulation of research questions and the design of research projects (83.3%).

- **Awardee Mentorship Satisfaction:** The majority of respondents were satisfied (N=5, 83.3%) with the mentorship they received from their primary mentors. Only one K99/R00 awardee reported being neutral with their mentorship experience.
- **Mentor Experience Satisfaction:** Six of seven K99/R00 awardee primary mentors (85.7%) reported being satisfied or very satisfied with their mentoring experience. One reported being dissatisfied.
- **Achieving Goals:** Among K99/R00 awardees, four of six (66.7%) reported they had either "exceeded" or "completely" achieved their short-term goals, while one had "mostly" completed and another "somewhat" completed their short-term goals. Likewise, four of six (66.7%) reported they had either "exceeded" or "completely" achieved their long-term goals, while one had "mostly" completed and another "somewhat" completed their long-term goals.
- **Funding Success:** Since starting their K99/R00 award, five of six (83.3%) awardees who responded indicated they have received one or more grants or contracts as PD/PI that build on their CER/PCOR research.
- **Research Career Outlook:** Among K99/R00 awardees, five of six (83.3%) reported they were "very likely" to continue in a research career over the next 5 years. One reported they were "somewhat unlikely."

Research Career Enhancement Awards for Established Investigators in PCOR (K18)

AHRQ funded 15 K18 career enhancement awards. The K18 mechanism of the PCORTF-TP aimed to support established investigators up to 50% effort across a 6-month to 1-year period, to augment or redirect their research focus and to further develop their research expertise in PCOR methodologies, as indicated below. K18 awardees were required to hold the rank of Associate Professor or Professor, or their equivalent in non-academic settings. K18 awardees held research doctoral degrees or medical degrees (i.e., 9 MDs and 6 PhDs), with four awardees additionally holding the MPH degree.

Awardees of this mechanism were mentored by qualified research faculty at their respective institutions and conducted mentored CER and PCOR research in a wide array of topic areas, including:

- ✓ Alzheimer's and dementia
- ✓ Atrial fibrillation (AF)
- ✓ Cancer; glioblastoma multiforme
- ✓ Chronic daily headache
- ✓ Computational modeling techniques; chronic disease; health disparities
- ✓ Depression and diabetes care
- ✓ Dialysis
- ✓ Intracerebral hemorrhage (ICH)
- ✓ Intensive care unit (ICU) mechanical ventilation
- ✓ Lupus in pregnancy
- ✓ mHealth; perinatal depression
- ✓ Nurse aid assignment in nursing homes
- ✓ Pediatric inflammatory bowel disease
- ✓ Surgery; rehospitalization
- ✓ Teamwork; patient communication

Thirteen of 15 K18 awardees (86.7%) completed the K Awardee/K12 Scholar Survey; seven of 14 K18 primary mentors (50.0%) completed the Mentor Survey.

Key Findings:

- **Award Completion Status:** Among the 13 K18 awardees responding to the evaluation survey, four (30.8%) indicated they had completed their award within the last 1-3 years, five (38.5%) indicated they had completed it within the last 3-5 years, and four (30.8%) had completed it more than 5 years ago.

Bibliometric Outcomes
K18 awardees (15 grantees over 6 months-2 years) produced:
- 84 publications
- 1,134+ citations

- **Initial CER/PCOR Knowledge Level:** At the start of their K18 award, 10 of 13 awardees (76.9%) reported having either no knowledge or being only somewhat knowledgeable about CER methods. The remaining awardees reported being more knowledgeable about CER methods. Similarly, 10 of 13 K18 awardees (76.9%) reported having either no knowledge or being only somewhat knowledgeable about PCOR approaches.
- **CER/PCOR Knowledge/Skill Attainment:** When K18 awardees were asked to what extent the support they received during their AHRQ PCOR award had contributed to their knowledge and skills across a range of CER methods, the majority (76.9% on average across all CER methods) of respondents indicated that it had contributed to a moderate or great extent across all of the methods, particularly designing pragmatic clinical trials (92.3%) and identifying gaps in the literature (92.3%). Likewise, a majority of respondents (78.8% on average across all PCOR approaches) indicated that their award had contributed moderately or greatly to their knowledge and skills of PCOR, particularly engaging stakeholders in research project implementation (84.6%).
- **Awardee Mentorship Satisfaction:** All K18 awardees who responded reported being either satisfied or very satisfied (N=13, 100%) with the mentorship they received from their primary mentors.

- **Mentor Experience Satisfaction:** All seven K18 awardee primary mentors (85.7%) reported being satisfied or very satisfied with their mentoring experience.
- **Achieving Goals:** Among K18 awardees, 11 of 13 (84.6%) reported they had either "exceeded" or "completely" achieved their short-term goals, while one had "mostly" completed and another "somewhat" completed their short-term goals. Likewise, 10 of 13 (66.7%) reported they had either "exceeded" or "completely" achieved their long-term goals, while two had "mostly" achieved and one had "somewhat" achieved their long-term goals.
- **Funding Success:** Since starting their K18 award, 11 of 13 (84.6%) awardees who responded indicated they have received one or more grants or contracts as PD/PI that build on their CER/PCOR research.
- **Research Career Outlook:** Among K18 awardees, 11 of 13 (84.6%) respondents reported they were "very likely" to continue in a research career over the next 5 years. Two reported they were "somewhat likely."

Infrastructure Development Program in PCOR (R24)

AHRQ funded seven R24 institutional grants to assist institutions with expertise in health services research in increasing their capacity to conduct PCOR.

Key Findings

Select accomplishments of all seven grantees are highlighted below.

Bibliometric Outcomes

R24 grantees (7 grantees and numerous participating scholars over 5 years) produced:

- 336 publications
- 4,429+ citations

1. One institution noted that it is now an active center for PCOR research, and PCOR is integrated into its training programs. Its PCOR graduate course is required for PhD students in the Rehabilitation Sciences program and for postdoctoral fellows in the PCOR postdoc certificate program. Research supported by this R24 funding has resulted in 69 publications in peer-reviewed journals.
2. Another institution reported the successful completion of three main CER/PCOR projects and nine pilot studies. PCOR Center core faculty and scholars produced 100 publications and $18.5 million in PCOR-related follow-on grants. Among these, 10 PCOR scholars received external career development awards and other grants totaling $10.2 million. The Center also increased general awareness of and involvement in PCOR at its own and partner institutions.
3. In building its PCOR capacity, one institution launched a PATIENTS Infrastructure Development program. Over the 5 years of the project, the PATIENTS program developed, tested, and improved unique approaches to infrastructure, engagement, and evaluation that have gone through several cycles of learning. The result is a set of best practices and lessons learned for patients and stakeholder engagement for patient-centered research to enhance CER, PCOR, and learning health system (LHS) models. PATIENTS continues to support investigators new to CER/PCOR and to invest resources in meaningful patient and community engagement.
4. Another institution's capacity building efforts included developing researchers and enhancing the infrastructure for using large data sets. It offers an online Master of Science in Academic Medicine (MSAM) degree within the Department of Family and Community Medicine, and has a Vascular Surgery Registry to support future research and quality improvement. The institution hosted 84 seminars and 35 webinars on PCOR skills and knowledge. It awarded 26 pilot studies in preparation for grant submissions, and its PCOR investigators engaged in 44 internal and 18 external research collaborations. In addition, the institution collaborated with the American

Academy of Family Physicians National Research Network on the project Enhancing Shared Decision Making in the Management of Chronic Pain.

5. One institution reported its infrastructure capacity building supported grant applications that have secured over $60 million in funding. This institution also has created a sustainable Patient Engagement Resource Center (PERC) and website and engaged over 400 patient advisors to support researchers and clinicians. Other accomplishments include training personnel in PCOR methods, developing efficient core processes for patient reported outcomes (PRO) data collection, the generation of new funded proposals, and numerous publications.
6. Another institution reported that its fellowship graduates attained experience in PCOR methodology. It successfully trained more than six investigators to become research experts, institutional leaders, and future mentors in CER/PCOR. A Community Advisory Panel was implemented and continues. The institution also established a comprehensive virtual data warehouse, which enables capacity for cross-system aggregation of electronic data to support CER across a spectrum of interventions in the context of PCOR. A series of primary and pilot projects laid the foundation for technology-based solutions to expanding care and communication with patients beyond the clinical setting.
7. The final institution was able to build an infrastructure to expand its research capacity in pediatric subspecialties through the establishment of the Center for Pediatric Comparative Effectiveness Research. This center was comprised of four "cores" that functioned together in a collaborative, integrated fashion for the development and conduct of CER/PCOR, as well as the implementation and dissemination of effective, evidence-based practices.

Based on a focus group conducted with all seven R24 grant principal investigators, it was agreed that the R24 grant was unique in addressing the need to build CER/PCOR infrastructure and should be continued. Valuable contributions as a result of this program included increasing awareness of the value of CER/PCOR, facilitating collaboration, and applying patient-centered principles to address health disparities.

Researcher Training & Workforce Development in Methods/Standards for Conducting PCOR (R25)

AHRQ issued awards to five R25 grant applicants who each served as PD for their respective R25 institution. The R25 PCORTF-TP mechanism aimed to provide support for awardees to develop, implement, and evaluate researcher education programs centering on methodologies and methodological standards used to conduct CER/PCOR, as noted below.

Key Findings

Select accomplishments of all five grantees are highlighted below.

1. One R25 grantee developed a comprehensive basic and advanced training program to build capacity in PCOR at seven minority-serving institutions (MSIs) across the country. Additionally, the grantee offered an experiential training program that provided more intensive training for select faculty members (fellows) through a mix of in-person and online training in PCOR methods, academic career development exercises, and applied research collaborations. A total of 119 unique participants were trained through the basic and advanced training programs, and 22 recruited scholars from the seven participating MSIs were selected and served as scholars through the experiential portion of the program.
2. Another R25 grantee and its partners developed a 48-module basic training series, which is now hosted on the edX learning management system platform. This program, which largely targets inexperienced participants, has reached over 8,300 individuals from approximately 100 countries, with 637 participants who have received certificates of training completion. The awardee institution also conducted 12 in-person advanced training workshops and 10 webinars, in collaboration with the American Society of Clinical Oncology, aimed at cancer researchers. Additionally, 28 trainees and young faculty participated in the experiential training component.
3. A third R25 grantee designed an experiential training program that combined in-person learning with asynchronous, online education. The program aimed to augment skills of the existing workforce to provide skills necessary to conduct CER and PCOR in diverse settings with regional partners that serve diverse populations. Over 100 individuals participated in a Summer Institute over 5 years, and a total of 48 scholars participated in more advanced training across five cohorts of scholar training.
4. A fourth grantee developed, implemented, and evaluated an education and training program focusing on PCOR methodologies comprised of basic, advanced, and experiential training. The basic training included a 1-week in-person introductory symposium on PCOR followed by asynchronous online courses. Advanced training brought PCOR investigators and methodologists together virtually for presentations/discussions regarding emerging/advanced PCOR study design and data analytic methods. A total of six clinical staff from the clinical affiliate organization participated in experiential training addressing a variety of healthcare topics.
5. The fifth grantee specialized in training about systematic evidence reviews. The basic training is online education about the purpose and process of systematic evidence reviews. Advanced training is in-person courses on how to conduct reviews. The grantee also offers video tutorials on how to conduct reviews. This grantee's experiential training involved offering personal consultations on how to conduct reviews.

3.3 Results by Evaluation Question

This section provides an integrated overview of findings across all forms of data collection relevant to the specific questions of interest in this evaluation (Table 2).

Career Development – All K Awardees and K12 Scholars

3.3.1 Evaluation Question 1a

What is the nature of PCORTF–TP activities for scholar and individual investigator career development at each site and for each program, and collectively across all grantee institutions?

Mentored research and research collaboration were the primary training modalities. They were also consistently regarded as the most important training modalities for CER/PCOR.

Based on the results of key informant interviews with K12 grant PDs and surveys with K Awardees, K12 Scholars, and primary mentors, mentored research and research collaborations related to both CER and PCOR were the primary and most important activities to build CER/PCOR capacity.

3.3.1.1 CER/PCOR Career Development Training Formats

K12 scholar training programs were generally directed toward junior (post-doc/early career) trainees and provided structured, regimented, and blended training formats. Highly structured scholar training was often customized to each scholar's CER/PCOR base knowledge and specific research topic areas of interest.

Other activities conducted across K12 programs include tailored didactic training, and training in grant-writing and application skills. K12 grantee PIs/PDs stated that peer networking is an important training activity. Box 1 provides three case examples of the training formats employed across the 15 K12 programs. Mentored research was a common element of all K12 programs.

Themes from K12 PI/PD Interviews

- *"Mentorship is "essential." Each year, our scholars evaluated the program. Consistently, they said the number 1 benefit of the program was mentoring."*
  -Participating K12 Program Director
- *"Mentors—more than didactic training or grant-writing training—are the central element of any training program."*
  -Participating K12 Program Director
- *"Early on, researchers have failures. Mentors can normalize failures and help researchers move forward."*
  -Participating K12 Program Director

Box 1: K12 PD-Reported Case Examples of Training Formats

Case 1

Scholars participated in a comprehensive, integrated, and multidisciplinary training program, coordinated by a Leadership Group and in collaboration with 3 partner organizations in the local area. The program trained PCOR scholars by focusing on 6 key areas: 1) epidemiology and biostatistics; 2) health services research; 3) outcomes research; 4) pragmatic clinical trials; 5) health information technology; and 6) collaboration with stakeholders and implementation in real-world settings. Trainees also participated in mentorship activities. Scholars chose a mentorship group and prepared an individualized curriculum based on their prior PCOR knowledge, research interests, and career goals. Mentors guided their scholars in PCOR design and implementation, and helped connect scholars to other experts or resources. Finally, scholars selected courses based on their training and interests, as determined in consultation with their mentors and the Leadership Group.

Case 2

Scholars participate in a tailored training program structured with 5 key features:

1. **High-quality mentoring.** Each scholar has a mentoring team comprised of a primary mentor, a co-mentor, and a patient advisor. An intensive mentoring workshop for scholars and mentors is also held.
2. **Experiential training.** The scholars meet monthly with the Stakeholder Engagement Core to discuss strategies and practical aspects of stakeholder engagement and to provide ready access to appropriate stakeholder experiences and connections.
3. **Topical seminar.** This is a tailored CER/PCOR seminar (alternating weeks) that is designed to address topics of relevance to the scholars' developing projects in real time. A topical bootcamp was held at the start of the program to provide an intensive review of the basics to assist in launching their research.
4. **Tailored didactics.** These are identified with mentors and the Didactics Training Director.
5. **K-community career development supports.** These seminars, mock grant reviews, and practical how-to meetings include all K Scholars throughout the institution.

Case 3

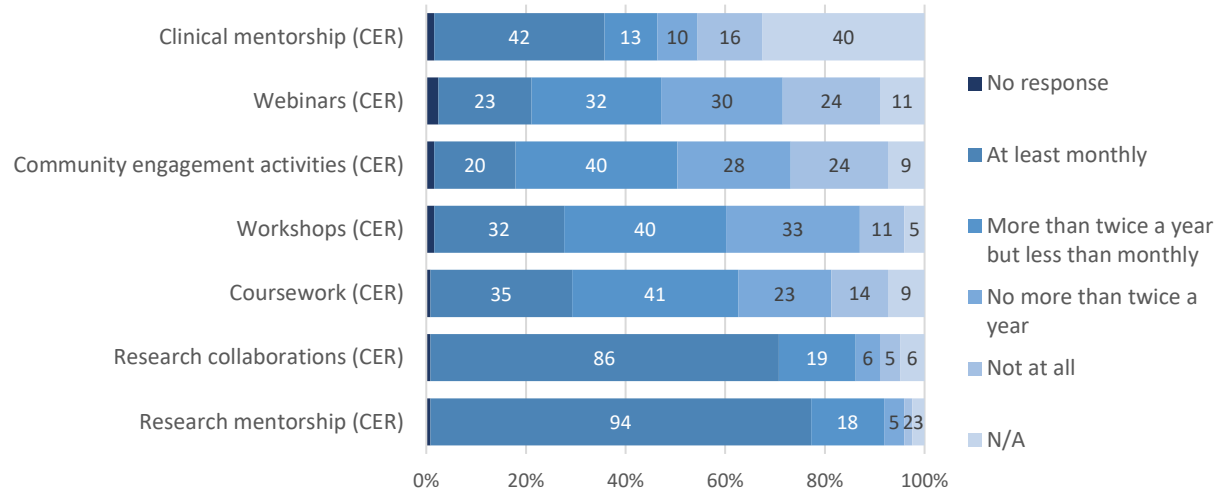
The program design reflects 4 central tenets of clinical investigator training, based on over 5 decades of successful experience: 1) the importance of individualized mentored training; 2) protected time; 3) multidisciplinary collaboration; and 4) structured didactic learning complementing practical applications of such learning through conduct of research. The specific aims of the training program are:

1. Develop a PCOR-mentored career development program for postdoctoral scientists integrating an individualized mentored research project with experiential or didactic learning.
2. Recruit well-qualified scholars who are dedicated to a career in PCOR using a strategy that encourages and supports persons from backgrounds underrepresented in biomedical research.

3. Utilize and continually improve an integrated core curriculum that prepares scholars for a career in CER as applied to PCOR by incorporating formal instruction in the methodological standards proposed by the Methodology Committee of PCORI within a framework of sustained stakeholder involvement.
4. Ensure a multidisciplinary and broad perspective by including scholars and faculty with different educational backgrounds and of different racial and ethnic minority groups.
5. Provide an administrative structure that supports the program, gives it cohesion, guides the selection of mentor advisory panels, and oversees the scholar's career development.
6. Evaluate the success of the program through both process and outcomes, and implement continuous quality improvement procedures to enhance the career development components, curriculum, and overall program.

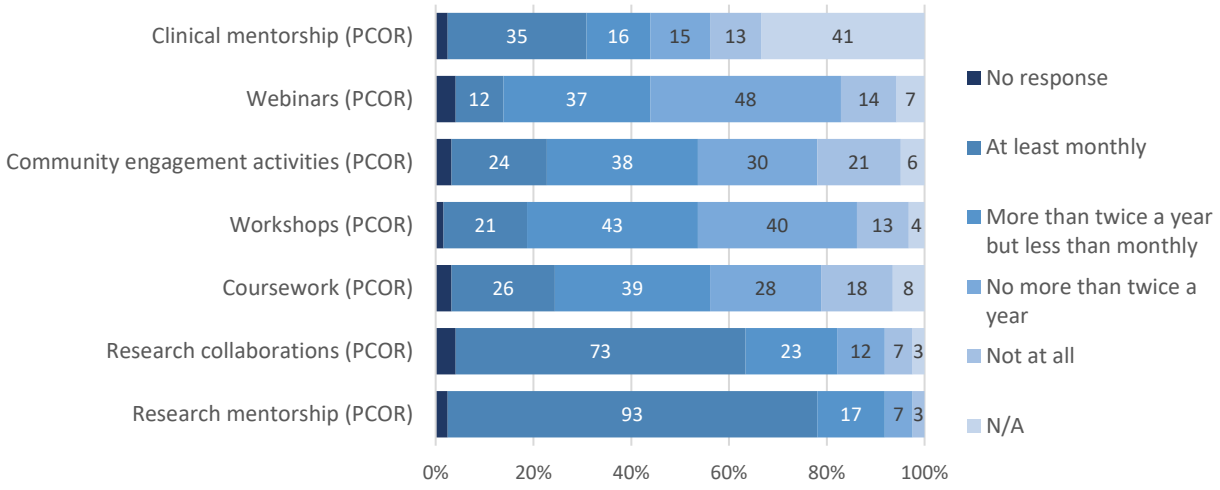
Consistent with the qualitative and secondary data sources described above, the results of the K Awardee/Scholar Survey revealed that research mentorship and research collaborations were the most frequently conducted training activities across the different K award mechanisms (Figures 7 and 8). Other activities conducted somewhat less frequently included coursework, workshops, and webinars.

Figure 7: K Awardee and K12 Scholar-Reported CER Training Formats



Data Source: K Awardee/Scholar Survey

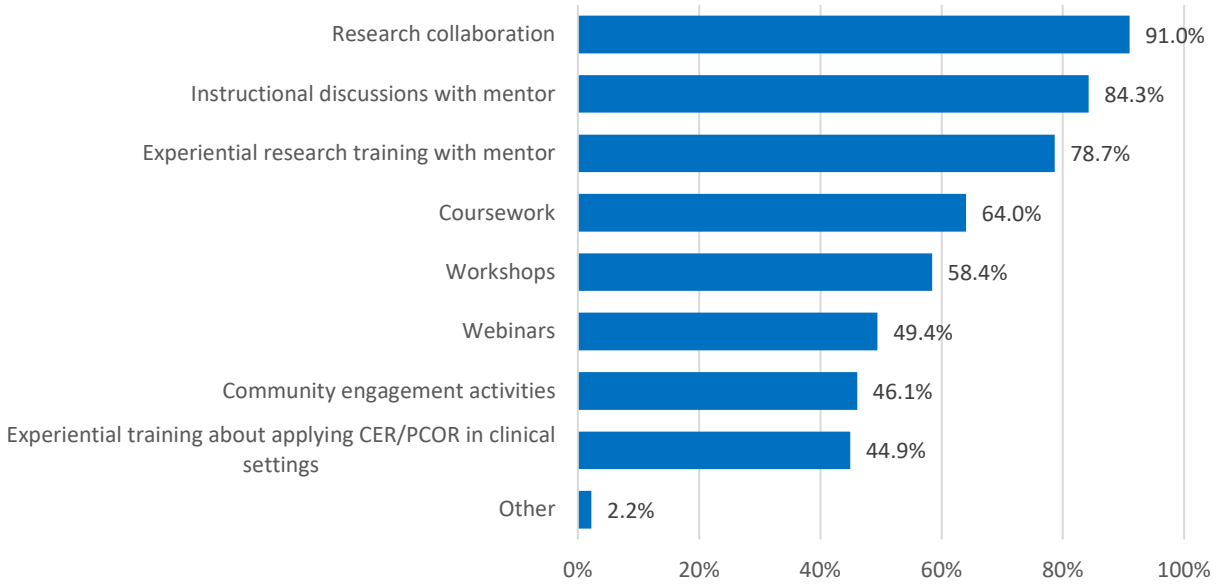
Figure 8: K Awardee and K12 Scholar-Reported PCOR Training Formats



Data Source: K Awardee/Scholar Survey

The above reported training formats are consistent with reports of primary mentors to questions posed in the Mentor Survey. Research collaboration and mentor-related training (both instructional discussion and experiential training) were the most frequently employed training formats (Figure 9). Other activities such as coursework, webinars, and workshops were also relatively frequent according to primary mentors.

Figure 9: Mentor-Reported CER/PCOR Training Activities of K Awardees and K12 Scholars



Data Source: Mentor Survey

Primary mentors also described the ways in which they worked with K awardee and K12 scholar mentees to build their CER/PCOR skills (Table 9). Nearly all primary mentors (96.6%, N=86) indicated that they worked with trainees to conceptualize and design their research projects, followed closely by supervising their research projects (87.6%, N=78). This is consistent with the training modalities cited as being used most often, which were largely applied supervised research. Other, less commonly selected ways, reflected the coursework and other instruction that was provided by mentors.

Table 9: Mentor-Reported Ways in which Mentors Fostered CER/PCOR Skills Development

How CER/PCOR Skills Were Fostered	N	Percent
Worked with trainees to conceptualize and design research projects	86	96.6%
Supervised independent research projects	78	87.6%
Referred trainees to work in other academic settings that provide opportunities to learn CER/PCOR skills	41	46.1%
Conducted workshops/seminars on CER/PCOR skills and applications	33	37.1%
Taught courses on CER/PCOR skills and applications	26	29.2%
Incorporated instruction in CER/PCOR into existing courses	26	29.2%
Referred trainees to work in clinical settings outside the mentee institution to learn CER/PCOR skills	19	21.3%
Developed courses on CER/PCOR skills and applications	18	20.2%
Other	1	1.1%

Data Source: Mentor Survey

3.3.1.2 Application of CER/PCOR Methods during Training

K Awardees and K12 Scholars were also queried about the specific CER/PCOR methods that they applied during their K award or K12 scholar appointment. The results are displayed in Table 10. Regarding CER methods, the majority of respondents reported using three or more CER methods, with a mean of 5 (median=5) listed methods. The most common methods were "*integrating quantitative and qualitative data sources*." Regarding PCOR methods, the majority of respondents cited employing at least two to three PCOR approaches during research conducted as part of their AHRQ PCORTF–TP K award or scholar appointment, with a mean of 3 (median=3). The most common approach was "*engaging stakeholders in the formulation of research questions and the design of research projects*."

Table 10: CER and PCOR Methods Used During Award or Appointment

CER Methods	N	Percent
Integrating quantitative and qualitative data sources	89	72.4%
Systematic literature/evidence searches	78	63.4%
Techniques to reduce confounding and potential bias inherent in observational studies	66	53.7%
Observational studies in the synthesis of evidence related to comparative effectiveness	63	51.2%
Subgroup analyses to determine which treatments and interventions work best for specific populations	59	48.0%
Implementation science methodology	50	40.7%
Systematic evidence appraisal and data abstraction	46	37.4%
Analysis of registries and data mining techniques	44	35.8%
Rigorous evidence synthesis and meta-analyses	30	24.4%
Pragmatic clinical trials	29	23.6%
Other	4	3.3%
PCOR Approaches	**N**	**Percent**
Engaging stakeholders in the formulation of research questions and the design of research projects	104	84.6%
Engaging stakeholders in research project implementation	90	73.2%
Collaboration with other institutions or research centers	81	65.9%
Engaging stakeholders in research dissemination	63	51.2%
None	2	1.6%
Other	1	0.8%

Data Source: K Awardee/Scholar Survey

3.3.1.3 Mentor Pairing Processes

Given the critical importance of mentorship in career development training programs, K Awardees, K12 Scholars, and their respective primary mentors were asked questions about their mentee/mentor pairing approach. K Awardees and K12 Scholars were specifically asked about how they were paired with their primary mentors and co-mentors (if applicable) for their AHRQ PCORTF–TP K Award or Scholar appointment. In terms of primary mentor pairing, the majority of K Awardee and K12 Scholar respondents indicated that they were already affiliated with an institution with a strong CER/PCOR training program and access to qualified investigators who were available to serve as a primary mentor (64.2%, N=79) or that they had already begun work with their primary mentor (48.0%, N=59). A total of 31 respondents (25.2%) indicated that they were both already affiliated with their institution and had already begun work with their primary mentor, suggesting that this is a common path to beginning work in CER/PCOR. This was a somewhat less common method for pairing with co-mentors (18.7%, N=23). A

total of 41 respondents (33.3%) indicated that they were referred to their co-mentors, and five (4.1%) indicated that they had no co-mentors.

Primary mentors were asked about both the mentee matching process and the number of individuals they mentored as part of the varied PCORTF Career Development training programs. In terms of how they were matched with their mentees (Table 11), the majority of primary mentor respondents (56.2%, N=50) noted that they were contacted by their mentee, while nearly half (47%, N=42) indicated that they sought out their mentee. Others were assigned by their institution or referred to the mentee.

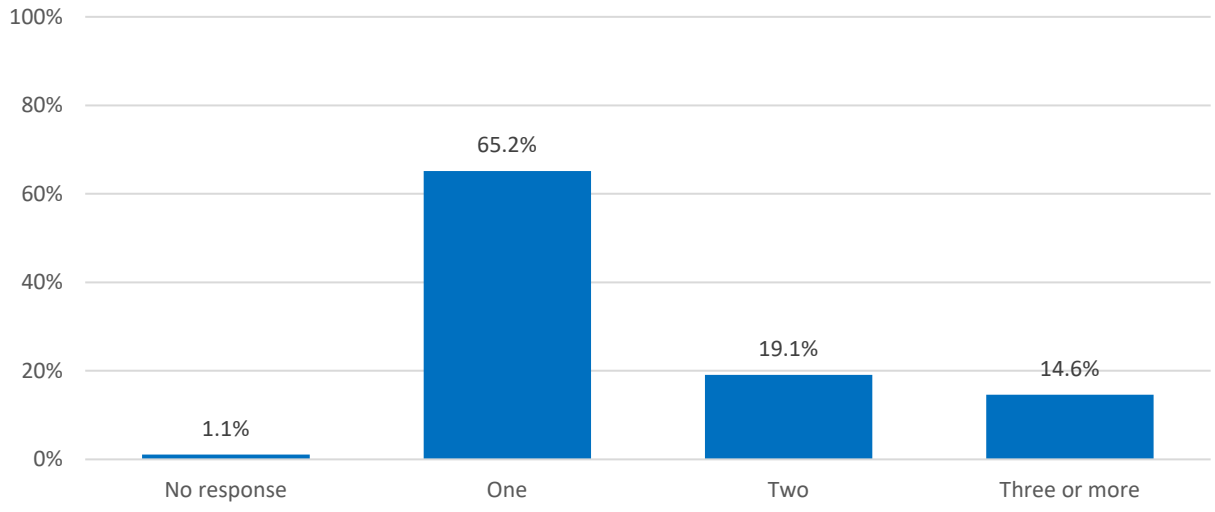
Table 11: Mentor-Reported Mentor/Mentee Pairing Methods

Methods of Being Paired with Mentee	N	Percent
Contacted by mentee	50	56.2%
Sought out mentee	42	47.2%
Assigned by program	12	13.5%
Referred to mentee	8	9.0%
Other (specify)	2	2.2%
Does not apply	1	1.1%

Data Source: Mentor Survey

Primary mentors were also asked how many mentees they were matched with as a primary mentor (Figure 10). The majority (65.2%, N=58) of respondents indicated that they were matched with only one mentee, though a number of primary mentors indicated that they were paired with two (19.1%, N=17) or three or more (14.6%, N=13).

Figure 10: Mentor-Reported Number of Mentees per Primary Mentor



Data Source: Mentor Survey

Primary mentors were asked how many other similar research career-stage trainees (e.g., post-doc, junior faculty) they have mentored in the past. The majority (56.2%, N=50) of respondents indicated that they had mentored more than 10 such trainees, while a quarter of respondents (25.8%, N=23) indicated between 6 and 10. Thus, the majority of mentor respondents had much experience in mentorship of similar research career-stage trainees.

Primary mentors were also asked to describe how mentorship of PCOR trainees has differed from other comparable non-PCOR mentorship (Table 12). Forty-two of the 78 respondents (53.85%) said that

mentoring a PCOR trainee was similar, or there was very little difference, to mentoring a non-PCOR trainee. The most mentioned difference was the patient-centered aspect of stakeholder engagement (15.4%, N=12). Eleven respondents (14.1%) indicated differences in terms of the structure or approach that accompanied the K12 program. One respondent commented that he/she had the trainee focus on training while getting a doctorate, then on improving his/her research skills, and then in later years, the "trainee broke through as an amazing PCOR researcher making an impact."

A smaller number of mentors indicated other differences. Six respondents (7.7%) felt the difference was engaging in patient-centered outcomes research. Three respondents (5.1%) noted that they had mentored only CER/PCOR trainees. Three respondents (5.1%) noted the difference depended on the trainee's own interests. Three respondents (5.1%) also indicated that the difference depended on the trainee's research experience, which tended to be less than that of non-PCOR trainees.

Table 12: Mentor-Assessed Differences in Mentoring PCOR Trainees vs. Non-PCOR Trainees

Responses	N	Percent
No different/Similar	42	53.9%
More patient-centered and/or stakeholder engagement	12	15.4%
Structure/Approach (with K12 program)	11	14.1%
Engaging in PCOR	6	7.7%
Only mentor PCOR/CER trainees	3	5.1%
Trainees' own interests/goals	3	5.1%
Trainees' prior training experience	3	5.1%

Data Source: Mentor Survey

3.3.2 Evaluation Question 1b

What are key grantee outputs of the scholar and individual investigator career development mechanisms?

Peer-reviewed publications of CER/PCOR research projects were the primary, most immediate outputs of K Awardees and K12 Scholars.

3.3.2.1 Bibliometrics

Across all K Awardees and K12 Scholars, a primary output based on bibliometric analysis was peer-reviewed publications. Between January 9, 2012, and December 31, 2020, a total of 1,649 publications were reported from K Awardees and K12 Scholars. Collectively, these publications have received 19,370 citations (as of 12/31/2020). More than 20% of these publications were ranked within the top 10% of cited papers in each given year, and the Category Normalized Citation Impact (CNCI) factor for the collection of publications was 1.751 (where a value of 1.0 is the world average for the same document type, year of publication, and subject area). Table 13 provides a summary view of select bibliometrics across K awardee and K12 scholar career development mechanisms.

Table 13: K Awardee and K12 Scholar Bibliometrics Summary

Grant Type RFA/PA	Approximate Grant Funding Period	Number of Pubs	Median Number Authors	Times Cited	% in Top 10 Percent	Category Normalized Citation Impact	Avg. Pubs per Awardee or Scholar (Range of Pubs)
K12 RFA-HS-12-001	2012 to 2014	66	6	1255	21.21%	1.414	**4.4** (2-7)
K12 RFA-HS-13-008	2014 to 2019	884	6	10272	21.04%	1.621	**8.6** (5-20)
K18 PAR-12-115	2012 to 2017	84	6	1134	11.90%	1.152	**5.6** (0-27)
K99/R00 RFA-HS-12-007	2013 to 2019	44	6	586	18.18%	1.851	**11.0** (4-25)
K99/R00 RFA-HS-13-002	2013 to 2019	61	5	705	27.87%	1.935	**12.2** (3-32)
K08 PA-13-180	2014 to 2021	416	6	4899	20.43%	2.292	**20.9** (1-83)
K01 PA-13-181	2014 to 2021	115	6	759	12.17%	1.164	**14.4** (2-40)

Data Source: Bibliometric Analysis

3.3.2.2 K Awardee and K12 Scholar Outputs

Consistent with the bibliometric analysis, K Awardees and K12 Scholars self-reported outputs of the program, including peer-reviewed publications associated with their CER/PCOR research projects as a primary output, among other outputs. Specifically, survey respondents were asked to describe specific CER/PCOR-related research, clinical, or educational projects that they have accomplished, developed, or employed as a result of their participation in this training program. Seventy individuals (~57%) provided a response. These activities generally fell into the following categories: submission of R01 funding grants or other research grants; receipt of or applications specifically for funding from the Patient-Centered Outcomes Research Institute (PCORI) for CER/PCOR research; development of new CER methods; use of specific PCOR approaches; and development of varied programs, toolkits, measures, or other interventions.

Diverse CER/PCOR training programs were key outputs of K12 institutional grants.

3.3.2.3 K12 Scholar Mentor Outputs

Based on responses to the Mentor Survey, 14 primary mentors (12 K12 mentors and 2 K awardee mentors) highlighted examples of the curricular programs' outputs. For the majority of primary mentor respondents, development of curricular outputs was not applicable to their roles as mentors. Table 14 provides specific details of those curricular programs.

Table 14: K12 Scholar Mentor-Reported Curriculum Development Outputs

Course Titles or Other Descriptions
Cost and Outcomes in Health and Medicine
Created a new workshop on Medical Decision Making
Epi 253 Effectiveness Research using Large Healthcare Databases
Designed courses in PCOR, CER, implementation research
Implementation and Dissemination Science
Methods and Study Designs for CER
Outcomes Research Group
Practical Data Analysis
Research Methods 1: Primary Data Collection
Research Methods, targeting postdoctoral fellows.
The Sociopolitical Context of Shared Decision-Making among African Americans, Interpersonal Aspects of Health Disparities

Data Source: Mentor Survey

Mentor Survey respondents were asked to describe up to three of the most meaningful or impactful research products or publications from their mentee(s) under the AHRQ PCOR K Training Program (Q16). A total of 59 respondents out of 89 (66.3%) answered this question.

Forty-one respondents (69.4%) identified specific publications, while 23 respondents (39.0%) identified 59 specific publications that had been collectively cited in 877 other publications. Of these, nine (15.3%) were qualitative studies, eight (13.6%) were retrospective studies, and six (10.2%) were cross-sectional.

In addition to publications, respondents offered other accomplishments and products developed by their mentees, such as collaborations with stakeholders and other researchers on committees, on boards, and at conferences (N=7, 11.9%); work on other studies (N=7, 11.9%); ongoing work on other grants/contracts or seeking funding (N=6, 10.2%); the development of tools, such as decision aids, measures, patient surveys (N=5, 8.5%), programs (N=4, 6.8%), and curricula (N=2, 3.5%); and mentees' becoming local experts (N=2, 3.5%). Other contributions mentioned by a single respondent (1.7%) were a mentee's co-presenting with a patient, using integrative health approaches, developing an intervention, mentoring others, becoming an independent researcher, developing a website, and taking on grant writing.

Four respondents discussed the impact of their mentees' work, with one stating that his/her mentee's work is contributing to forming the basis for future interventions to standardize surgical decision making for ureteropelvic junction obstruction in infants and decrease racial and ethnic disparities in surgical decisions. One respondent noted his/her mentee received an American Heart Association presidential award for new investigators. Another respondent said that his/her mentee developed an outcome measurement system that is now being used by fellow clinicians, as well as published/submitted more than 10 peer-reviewed articles in prestigious journals. The final respondent stated his/her mentee conducted three randomized controlled trials, and the publications from these studies have set a national benchmark for how to design and implement rigorous community health worker programs.

3.3.3 Evaluation Question 1c

What are key grantee outcomes, and how do these activities contribute to meeting the PCORTF–TP outcomes?

K Awardees and K12 Scholars report increased knowledge about and use of CER methods and PCOR approaches, and continued application of such methods/approaches following the conclusion of the PCORTF career development training programs.

K awardee and K12 outcomes of interest were assessed using several metrics, including CER and PCOR knowledge and skill level, achievement of short- and long-term goals, influence of the program on career plans and the intended and continued use of CER/PCOR methods, attainment of specific career landmarks and CER/PCOR funding, and various other accomplishments resulting from program participation.

3.3.3.1 CER and PCOR Knowledge Gains

K Awardee and Scholar Survey respondents were asked to describe the extent to which their training under the AHRQ PCORTF–TP K award or K12 scholar appointment contributed to their knowledge and skills in CER methods/approaches, as well as to their skills and use of specific PCOR approaches.

The CER methods and approaches cited as being acquired to the largest extent include the ability to integrate quantitative and qualitative data sources and identify gaps in the literature. This was followed closely by conducting systematic literature/evidence searches and systematic evidence appraisal, using techniques to reduce confounding and potential bias inherent in observational studies, and using observational studies in the synthesis of evidence related to comparative effectiveness (Table 15). With regard to strengthened skills and use of specific PCOR approaches, K Awardees and K12 Scholars indicated that participation in PCORTF–TP contributed greatly to the strengthening of skills across all of the PCOR approaches listed in the survey (Table 16).

Table 15: K Awardee and K12 Scholar-Reported CER Knowledge/Skills Acquired

CER-Related Methods/Approaches	Greatest Extent	Least Extent
Integrating quantitative and qualitative data sources	83.7%	12.2%
Identifying gaps in the literature	82.9%	14.6%
Conducting systematic literature/evidence searches	73.2%	22.0%
Using techniques to reduce confounding and potential bias inherent in observational studies	74.8%	18.7%
Using observational studies in the synthesis of evidence related to comparative effectiveness	76.4%	17.1%
Conducting systematic evidence appraisal and data abstraction	70.7%	24.4%
Designing pragmatic clinical trials	63.4%	27.6%
Implementation science methodology	67.5%	25.2%
Conducting subgroup analyses to determine which treatments and interventions work best for specific populations	69.1%	22.0%

CER-Related Methods/Approaches	Greatest Extent	Least Extent
Conducting pragmatic clinical trials	56.1%	32.5%
Conducting rigorous evidence synthesis and meta-analyses	57.7%	36.6%
Using registries and data mining techniques	54.5%	37.4%

Data Source: K Awardee/Scholar Survey

Table 16: K Awardee and K12 Scholar-Reported PCOR Skills Strengthened

PCOR Approaches	Greatest Extent	Least Extent
Engaging stakeholders in the formulation of research questions and the design of research projects	87.8%	10.6%
Engaging stakeholders in research project implementation	82.1%	15.4%
Engaging stakeholders in research dissemination	78.0%	17.9%
Collaboration with other institutions or research centers	79.7%	18.7%

Data Source: K Awardee/Scholar Survey

Table 17 presents the CER methods and PCOR knowledge and skills gains by the K award mechanism. Specifically, Table 17 presents the percentage of K Awardees/K12 Scholars who indicated that their AHRQ PCOR training had contributed to a moderate or great extent to their knowledge of specific CER methods and PCOR approaches. Average knowledge gains across CER methods were: K01 70%, K08 76.3%, K12 65%, K18 76.9%, and K99/R00 65.3%. Average knowledge gains across PCOR methods were: K01 75%, K08 90.8%, K12 81.3%, K18 78.8%, and K99/R00 75%.

Table 17: CER and PCOR Knowledge Gains by K Award Mechanism

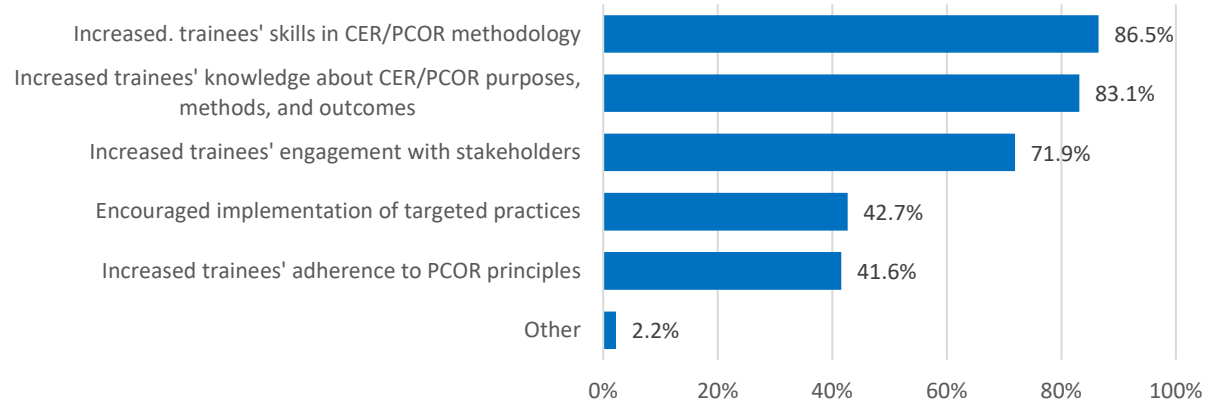
CER Methods	K01	K08	K12	K18	K99/R00
Designing pragmatic clinical trials	60.0%	63.2%	58.8%	92.3%	66.7%
Conducting pragmatic clinical trials	60.0%	52.6%	56.3%	61.5%	50.0%
Integrating quantitative and qualitative data sources	80.0%	100.0%	83.8%	69.2%	66.7%
Identifying gaps in the literature	80.0%	100.0%	78.8%	92.3%	66.7%
Conducting systematic literature/evidence searches	100.0%	84.2%	68.8%	76.9%	66.7%
Conducting systematic evidence appraisal and data abstraction	80.0%	84.2%	66.3%	76.9%	66.7%
Conducting rigorous evidence synthesis and meta-analyses	40.0%	57.9%	57.5%	69.2%	50.0%
Using observational studies in the synthesis of evidence related to comparative effectiveness	100.0%	89.5%	70.0%	84.6%	83.3%
Using techniques to reduce confounding and potential bias inherent in observational studies	100.0%	78.9%	75.0%	69.2%	50.0%
Implementation science methodology	60.0%	78.9%	63.8%	84.6%	50.0%
Using registries and data mining techniques	20.0%	47.4%	53.8%	69.2%	83.3%
Conducting subgroup analyses to determine which treatments and interventions work best for specific populations	60.0%	78.9%	65.0%	76.9%	83.3%

PCOR Approaches	K01	K08	K12	K18	K99/R00
Engaging stakeholders in the formulation of research questions and the design of research projects	100.0%	94.7%	87.5%	76.9%	83.3%
Engaging stakeholders in research project implementation	60.0%	89.5%	82.5%	84.6%	66.7%
Engaging stakeholders in research dissemination	80.0%	78.9%	78.8%	76.9%	66.7%
Collaboration with other institutions or research centers	60.0%	100.0%	76.3%	76.9%	83.3%

Data Source: K Awardee/Scholar Survey

Primary mentors were also asked to identify outcomes their mentees had experienced through their participation in PCORTF training programs (Figure 11). The two top-cited targeted outcomes were increased trainee skills in CER/PCOR methodology (86.5%, N=77) and increased knowledge about CER/PCOR purposes, methods, and outcomes (83.1%, N=74). Increased engagement with stakeholders was also a commonly selected outcome for trainees (71.9%, N=64).

Figure 11: Mentor-Reported Program Outcomes of Mentees



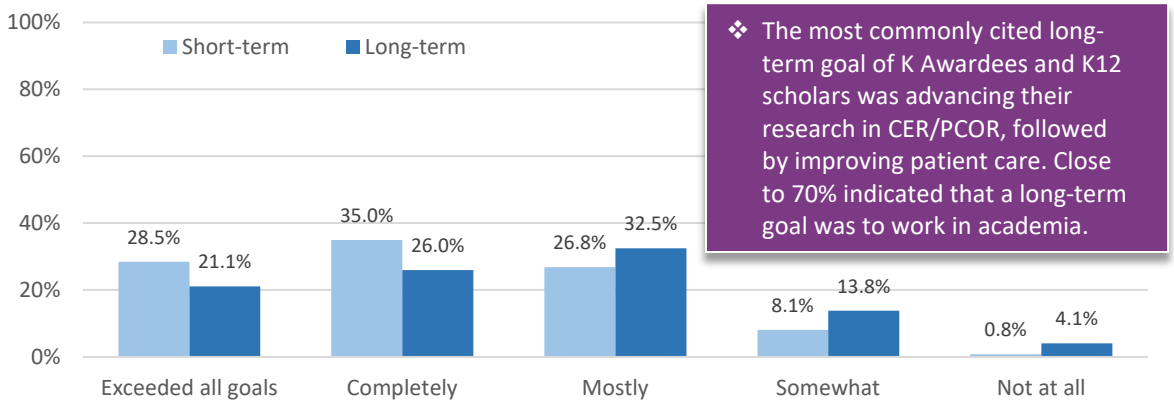
Data Source: Mentor Survey

K Awardees and K12 Scholars largely reported meeting or exceeding both their short-term and long-term goals, which were evident in the many career landmarks that awardees and scholars cited achieving.

3.3.3.2 Achievement of Short- and Long-Term Goals

K Awardees and K12 Scholars rated the degree to which they were able to achieve their short- and long-term goals. The results are shown in Figure 12. Notably, the majority of respondents indicated that they had mostly achieved, completely achieved, or exceeded achievement of their short-term (90.3%) and long-term (79.6%) goals.

Figure 12: K Awardee and K12 Scholar-Reported Achievement of Short- and Long-Term Goals



❖ The most commonly cited long-term goal of K Awardees and K12 scholars was advancing their research in CER/PCOR, followed by improving patient care. Close to 70% indicated that a long-term goal was to work in academia.

Data Source: K Awardee/Scholar Survey

K Awardees and K12 Scholars also selected from a list of options what their short- and long-term goals were at the start of their AHRQ PCORTF–TP K award or scholar appointment. The results are shown in Table 18 below. In terms of short-term goals, the majority indicated improving ability to secure research funding as a key goal, followed by gaining knowledge of PCOR, publications/presentations, and expanding knowledge and skills related to CER and PCOR. The most commonly cited long-term goal was advancing research in CER/PCOR, followed by improving patient care quality.

Table 18: Short- and Long-Term Goals of Program Participants

Short-Term Goals	N	Percent
Improve my ability to secure future research funding	109	88.6%
Gain specific knowledge and skills related to PCOR	101	82.1%
Author publications and presentations	96	78.0%
Expand on my PCOR research skills	92	74.8%
Expand on my CER research skills	83	67.5%
Gain specific knowledge and skills related to CER methods	81	65.9%
Gain guidance and mentoring in health services research in general	75	61.0%
Develop or improve research leadership and management skills	72	58.5%
Other	0	0.0%
Long-Term Goals		
Advance my research field of study in CER/PCOR	97	78.9%
Improve the quality of patient care	88	71.5%
Work in academia	85	69.1%
Obtain follow-up funding support in health services research	84	68.3%
Obtain follow-up funding support specifically related to CER/PCOR	67	54.5%
Obtain independent research position	64	52.0%
Obtain independent research position with a focus on CER/PCOR	44	35.8%
Other	3	2.4%

Data Source: K Awardee/Scholar Survey

3.3.3.3 *Influence on Career and Research Plans*

Several questions in the K Awardee/K12 Scholar Survey assessed the influence of PCORTF–TP on future career plans, including both future research plans and other ways in which program participants might use CER/PCOR in their work.

CER/PCOR Career Plans

K Awardees and K12 Scholars were asked to describe how the training received as an AHRQ PCORTF–TP K awardee or scholar influenced their career plans (Table 19). The vast majority indicated that their participation had increased their interest in conducting CER/PCOR research and/or implementing it in their clinical practice. Notably, nearly two-thirds of respondents expressed increased interest in mentoring others in CER/PCOR. However, there were a handful (N=8) who indicated that participation in the program had decreased their interest in conducting CER/PCOR. Of these, four were individuals who expressed being dissatisfied with their mentor experience.

Table 19: PCORTF Training Program Influence Career and Research Plans

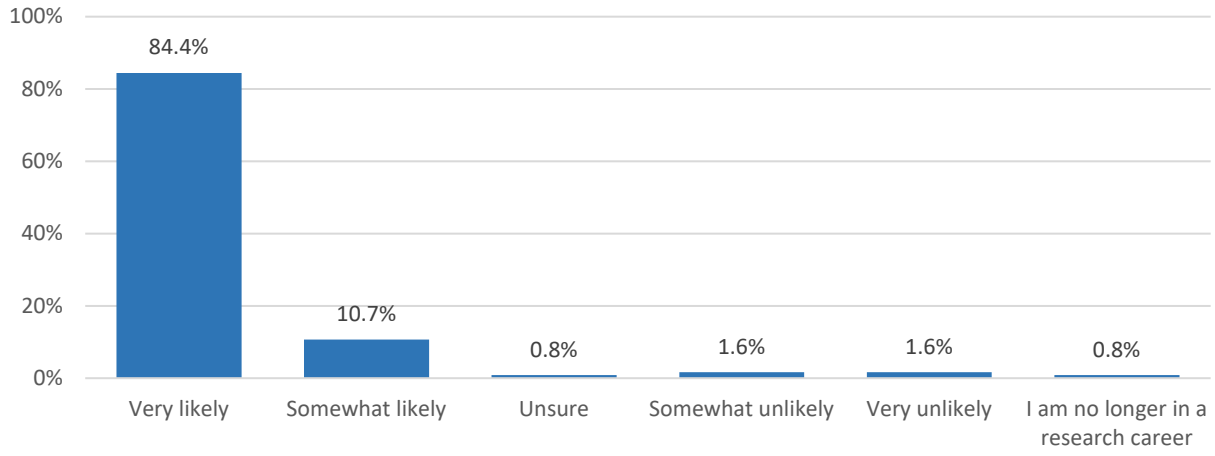
CER/PCOR Career Plans	N	Percent
Increased interest in conducting CER/PCOR research	104	84.6%
Increased interest in mentoring others in CER/PCOR	76	61.8%
Increased interest in implementing CER/PCOR in clinical practice	72	58.5%
Decreased interest in conducting CER/PCOR research	8	6.5%
Other	1	0.8%

Data Source: K Awardee/Scholar Survey

Future CER/PCOR Research Plans

Respondents were asked how likely they are to continue in a research career in the next 5 years (Figure 13). The overwhelming majority (84.4%, N=103) indicated that they are very likely to continue a research career. Only one individual indicated they were no longer in a research career. Those respondents who indicated that they were unlikely or unsure about continuing in a research career cited lack of or challenges obtaining necessary funding as key reasons.

Figure 13: Likelihood of Continuing to Pursue a Research Career



Data Source: K Awardee/Scholar Survey

3.3.3.4 Application of CER/PCOR Skills

K Awardees and K12 Scholars were asked to describe how they have applied CER/PCOR training to the research projects conducted as part of their AHRQ PCORTF–TP K award or scholar appointment. The three key applications of their training were developing a plan for ongoing CER/PCOR (70.7%, N=87), applying for additional CER/PCOR research funding (69.1%, N=85), and conducting additional CER/PCOR research (68.3%, N=84).

- Nearly 40% of K Awardees and K12 scholars (N=46) indicated they had served as a CER/PCOR mentor to others, an important indicator of building capacity for CER/PCOR.

3.3.3.5 Other Key Accomplishments

In an open-ended survey question, K Awardees and K12 Scholars were asked to describe specific CER/PCOR-related research, clinical, or educational projects that they have accomplished, developed, or employed as a result of their participation in this training program. Seventy (~57%) responded with activities falling into several different categories, including submission of R01 funding grants or other research grants; receipt of or applications specifically for funding from PCORI for CER/PCOR research; development of new CER methods; use of specific PCOR approaches; and development of varied programs, toolkits, measures, or other interventions.

- Nearly 75% of K Awardees and K12 scholars (N=54) reported being currently active in CER and/or PCOR projects.
- In an open-ended question, nearly 60% reported having received an R01 or a PCORI grant for CER/PCOR, or the continued use of CER/PCOR approaches and methods.

The majority (N=54, 73%) are currently active in ongoing CER and/or PCOR projects. As described in more depth below, more than a third of respondents (N=32, 43.2%) indicated they have sought R01 funding or other grant funding, while an additional eight respondents (10.8%) have sought or received PCORI funding to conduct research. Thirty-one respondents (41.9%) indicated they were developing varied programs, toolkits, measures, and/or other interventions.

3.3.3.6 Continued Use of CER/PCOR Research Methods

A key measure of success of the program is the ongoing use of CER methods and PCOR approaches. Two questions in the K Awardee/Scholar Survey assessed this.

CER Methods

Respondents were asked to describe the specific CER methods that they have employed since completing their AHRQ PCORTF–TP K award or K12 scholar appointment (Table 20). The majority of respondents indicated integration of quantitative and qualitative data sources. This was followed closely by systematic literature/evidence searches and learning techniques to reduce confounding and potential bias in observational studies.

Table 20: Use of CER Methods Since Completing Award or Appointment

CER Methods	N	Percent
Integrating quantitative and qualitative data sources	68	55.3%
Systematic literature/evidence searches	62	50.4%
Techniques to reduce confounding and potential bias inherent in observational studies	60	48.8%
Observational studies in the synthesis of evidence related to comparative effectiveness	55	44.7%

Subgroup analyses to determine which treatments and interventions work best for specific populations	55	44.7%
Implementation science methodology	53	43.1%
Analysis of registries and data mining techniques	46	37.4%
Pragmatic clinical trials	40	32.5%
Systematic evidence appraisal and data abstraction	39	31.7%
Rigorous evidence synthesis and meta-analyses	27	22.0%
None	4	3.3%
I no longer do research	1	0.8%

Data Source: K Awardee/Scholar Survey

PCOR Methods

Respondents were also asked to describe the specific PCOR approaches they have incorporated into their research since completing their AHRQ PCORTF-TP K award or K12 scholar appointment (Table 21). The most common approaches indicated were engaging stakeholders in the formulation of research questions and the design of research projects.

Table 21: K Awardee and K12 Scholar-Reported Use of PCOR Approaches

PCOR Approaches	N	Percent
Engaging stakeholders in the formulation of research questions and the design of research projects	81	65.9%
Collaboration with other institutions or research centers	79	64.2%
Engaging stakeholders in research project implementation	73	59.3%
Engaging stakeholders in research dissemination	64	52.0%
None	3	2.4%
I no longer do research.	1	0.8%

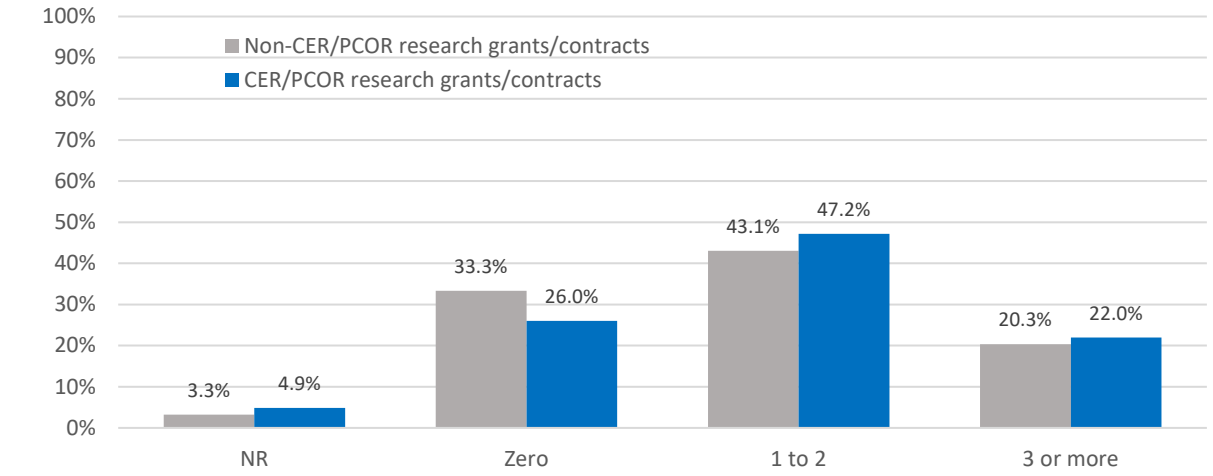
Data Source: K Awardee/Scholar Survey

3.3.3.7 Securing CER/PCOR Research Funds

A number of the questions for K Awardees and K12 Scholars related to obtaining research funds both during and following their career development award or appointment, and the type and sources of funding received.

First, K Awardees and K12 Scholars were asked about the number of both CER/PCOR and non-CER/PCOR grants they have received as a PD/PI since their AHRQ PCORTF–TP K award or scholar appointment (Figure 14). Notably, close to 70% indicated that they had received one or more grants/contracts with a CER/PCOR focus, while 63% reported receiving one or more non-CER/PCOR-focused research grants/contracts since completing their AHRQ PCORTF–TP K award or scholar appointment. Of note, a small percentage of respondents were still active in PCORTF–TP at the time of completing this survey.

Figure 14: Distribution of CER/PCOR and Non-CER/PCOR Funding Received

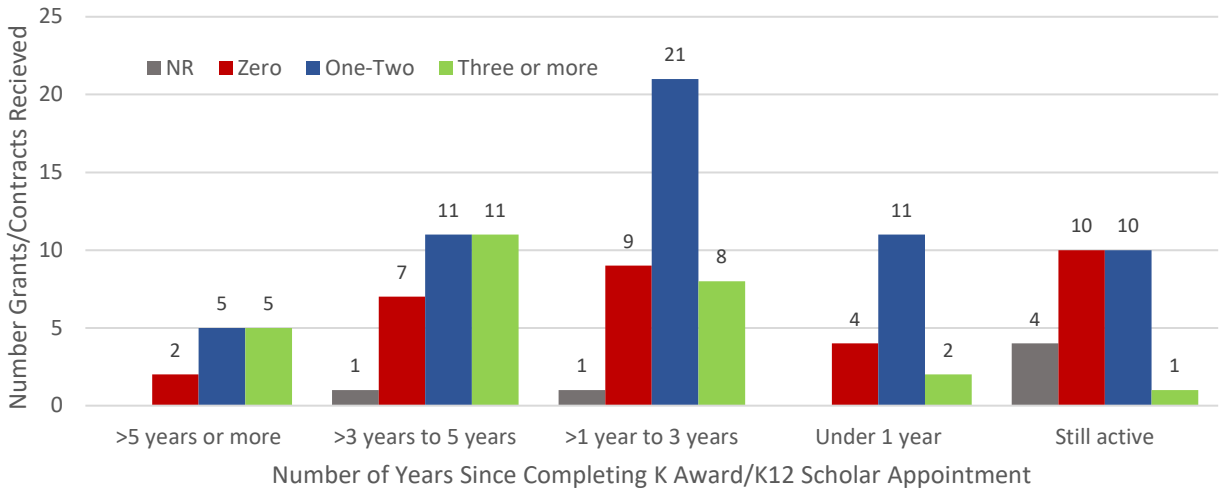


Data Source: K Awardee/Scholar Survey

K Awardees and K12 Scholars also reported the number of CER/PCOR grants received since completing their PCORTF career development award (Figure 15). Respondents whose K award or K12 scholar appointment was still active were more likely to have not yet received a subsequent grant or contract.

In terms of the types of funding awards received, close to 32% of respondents indicated receiving an independent research grant (e.g., R01, R03). Approximately 20% reported a contract, while close to 25% indicated receiving a training grant. Among the more than 25% (N=32) who chose "other," the primary responses were divided nearly equally between two sources: foundation support and internal institutional support. The largest source of funding was identified as the Federal government, followed by foundations and university support.

Figure 15: K Awardee and K12 Scholar-Reported CER/PCOR Grants Received



Data Source: K Awardee/Scholar Survey

K Awardees and K12 Scholars were also asked several questions related to their future plans for seeking CER/PCOR research grant/contract funding. When asked about the likelihood of seeking future CER/PCOR research grant/contract funding, close to 57% indicated that they were very likely to seek such funds. Only a small proportion (5.7%) indicated that they were somewhat or very unlikely to seek

such funding. The majority (66.7%, N=82) indicated plans to seek independent research grants (e.g., R01, R03), largely from Federal Government sources.

K12 PDs concurred that many K12 Scholars had obtained faculty appointments at their respective institutions and were leading successful CER/PCOR careers.

3.3.3.8 Career Landmarks Attained

- The most common career landmark cited by K Awardees and K12 scholars was the publication of peer-reviewed articles and/or books, followed by receipt of additional research funding.

K Awardees and K12 Scholars were asked to identify all applicable career landmarks that they attributed to their receipt of an AHRQ PCORTF–TP K award or K12 scholar appointment. Most respondents identified more than one career landmark achieved, with the average number being six (median=5). Not surprisingly, the most common career landmark associated with the AHRQ PCORTF–TP award was the publication of peer-reviewed articles and/or books, followed by receipt of additional research funding (Table 22). "Other" career landmarks cited included:

- "Promotion to associate professor" (N=2)
- "The award was beneficial. I am developing an investigator-initiated CER/PCOR and HSR research program as a result of the protected time afforded by the AHRQ/PCOR K12 Award."
- "The K12 provided me with the protected time necessary to become an independent scientist. It allowed me to stay in the academy and to build the skills necessary to receive funding for work that matters."

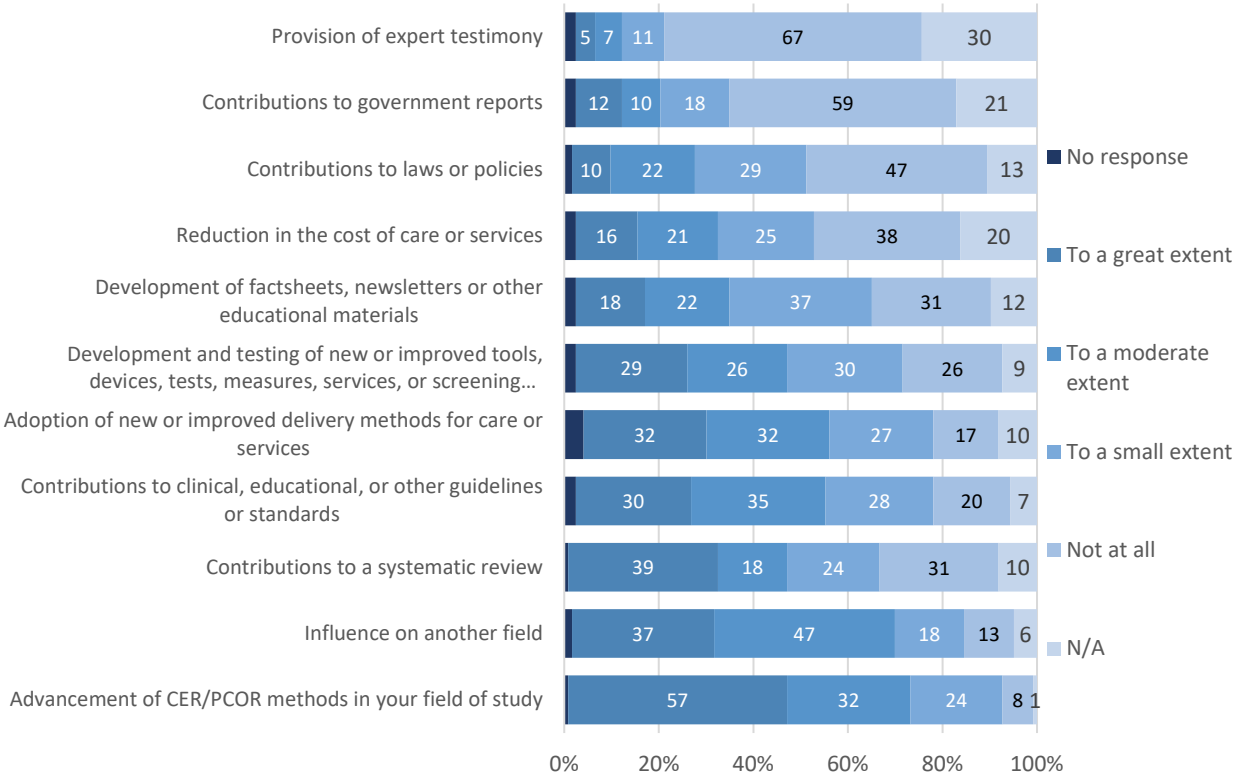
Table 22: K Awardee and K12 Scholar-Reported Notable Career Landmarks

Career Landmark	N	Percent
Publication of peer-reviewed articles and/or books	105	85.4%
Receipt of additional research funding	92	74.8%
Appointment as mentor to other researchers	72	58.5%
Receipt of additional research funding specifically to conduct CER/PCOR	58	47.2%
Employment of additional researchers and support staff	57	46.3%
Attainment of a faculty position	56	45.5%
Increased salary	51	41.5%
Receipt of professional honors or distinctions	47	38.2%
Establishment of an independent health services research program	42	34.1%
Service on editorial boards, peer review panels, advisory councils	42	34.1%
Establishment of an independent CER/PCOR program	29	23.6%
Appointment as department/division chair, dean, provost, president, or other leadership position	22	17.9%
Receipt of tenure	16	13.0%
Other	5	4.1%

Data Source: K Awardee/Scholar Survey

K Awardees and K12 Scholars were also asked about accomplishments stemming from participation in PCORTF–TP (Figure 16). Advancement of CER/PCOR methods in respondents' own field of study was accomplished to a great or moderate extent by 72.2% of respondents, followed by influence on another field of study by 68.3% of respondents.

Figure 16: K Awardee and K12 Scholar-Assessed Accomplishments



Data Source: K Awardee/Scholar Survey

3.3.4 Evaluation Question 1d

Which activities for PCORTF–TP scholars/investigators have the greatest influence on intended outcomes (e.g., PCOR careers, future research, future funding)?

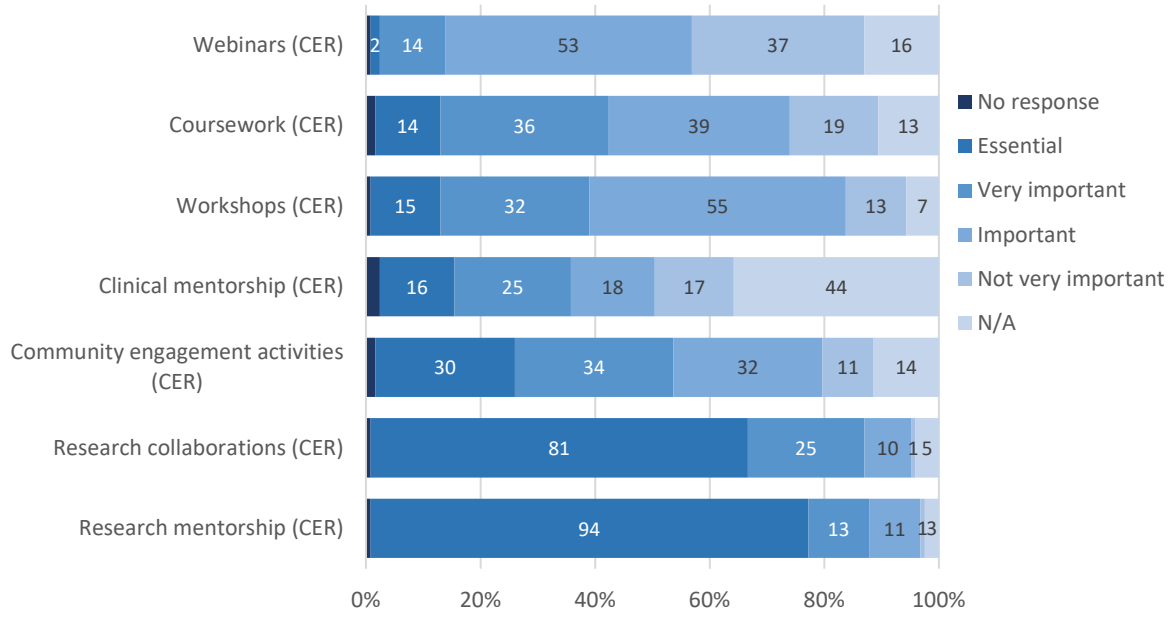
Compensated protected time for K Awardees and K12 Scholars during the program was critical to the success of program participants.

Several evaluation metrics measured the extent to which K Awardees, K12 Scholars, and primary mentors deemed particular training formats and activities to be influential on program outcomes. Respondents largely endorsed specific CER and PCOR training approaches as well as mentorship relationships and experiences, as described below.

3.3.4.1 Importance of Training Formats on CER/PCOR Career Development

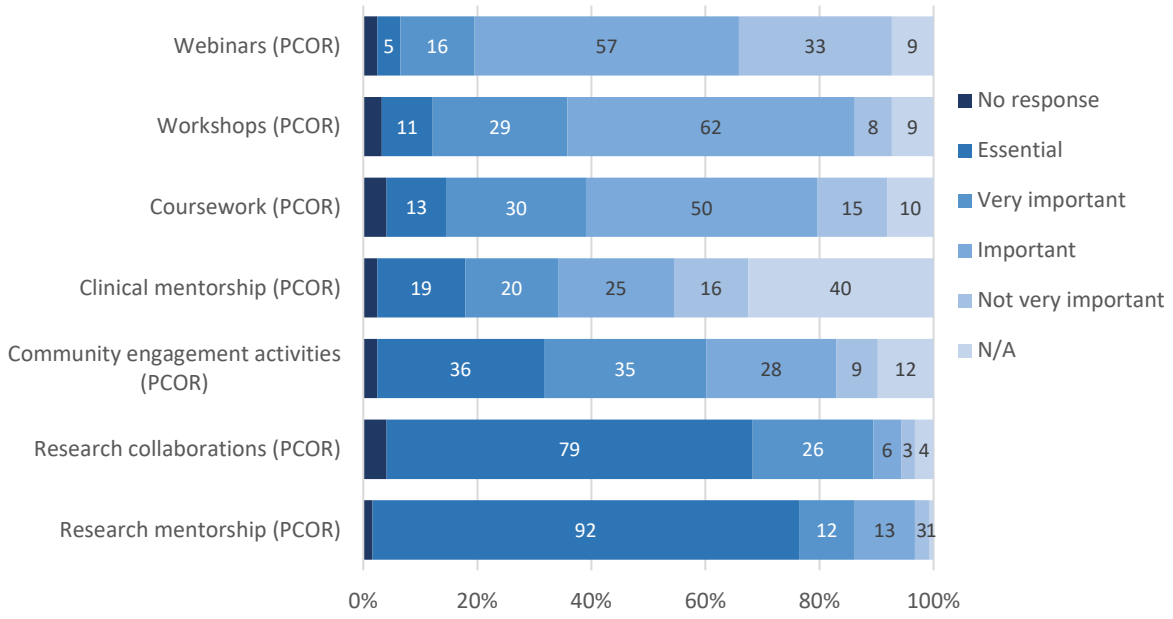
K Awardees and K12 Scholars were asked to rate the importance of each training format for their CER (Figure 17) and PCOR (Figure 18) training. Research mentorship and collaborations were rated as the most important formats across the respondents for both CER and PCOR training.

Figure 17: K Awardee and K12 Scholar-Assessed Importance of CER Training Formats



Data Source: K Awardee/Scholar Survey

Figure 18: K Awardee and K12 Scholar-Assessed Importance of PCOR Training Formats



Data Source: K Awardee/Scholar Survey

Primary mentors were likewise asked to identify the most important training modalities for CER/PCOR among postdoctoral and junior faculty (Table 23). Consistent with the data gathered for this evaluation,

largely applied, supervised research was rated as the most important training modality for CER/PCOR career development.

Table 23: Mentor-Assessed Best Training Modalities for CER/PCOR

Training Modalities	N	Percent
Largely applied (supervised research project)	71	79.8%
Blended (didactic/experiential)	51	57.3%
Seminar series	21	23.6%
Journal clubs	16	18.0%
Other	7	7.9%
Largely didactic (classroom based)	0	0.0%

Data Source: Mentor Survey

Primary mentors were also asked which CER methods and PCOR approaches they considered to be most important for mentees/scholars to learn during PCORTF–TP (Table 24). The CER methods and approaches cited as being most important to learn by more than 50% of respondents included integrating quantitative and qualitative data sources (78.7%, N=70), designing pragmatic clinical trials (68.5%, N=61), identifying gaps in the literature (61.8%, N=55), implementation science methodology (60.7%, N=54), and conducting pragmatic clinical trials (56.2%, N=50).

Table 24: Mentor-Assessed Importance of CER Methods and PCOR Approaches

CER Methods	N	%
Integrating quantitative and qualitative data sources	70	78.7%
Designing pragmatic clinical trials	61	68.5%
Identifying gaps in the literature	55	61.8%
Implementation science methodology	54	60.7%
Conducting pragmatic clinical trials	50	56.2%
Using techniques to reduce confounding and potential bias inherent in observational studies	43	48.3%
Conducting systematic literature/ evidence searches	41	46.1%
Using observational studies in the synthesis of evidence related to comparative effectiveness	35	39.3%
Conducting subgroup analyses to determine which treatments and interventions work best for specific populations	32	36.0%
Conducting rigorous evidence synthesis and meta-analyses	21	23.6%
Conducting systematic evidence appraisal and data abstraction	19	21.3%
Using registries and data mining techniques	19	21.3%
Other	7	7.9%
PCOR Approaches	**N**	**%**
Engaging stakeholders in the formulation of research questions and the design of research projects	73	82.0%
Engaging stakeholders in research project implementation	63	70.8%
Engaging stakeholders in research dissemination	56	62.9%
Collaboration with other institutions or research centers	43	48.3%
Other	5	5.6%

Data Source: Mentor Survey

When asked to describe why each of these CER methods and PCOR approaches was most important, primary mentors noted that CER researchers must understand the full range of methods and when to apply them. One respondent said: "[CER methods] are all integral and essential for career development in patient-centered research." Another said: "These are all skills that contribute to a well-rounded CER/PCOR-focused investigator. Even if some of the skills are not directly adopted by a trainee, it is important for him/her to understand the concepts behind those methods to facilitate a better understanding of the CER/PCOR literature and to facilitate multidisciplinary collaborations." Mentors also emphasized that researchers must know how to apply the methods rigorously, and that pragmatic trials are important because they produce results in real-world contexts, where actual clinical care occurs.

Regarding the importance of learning and using specific PCOR approaches, mentors commented that engaging stakeholders—including patients and their families—is fundamental to doing good research and ensuring that it is meaningful to stakeholders. One mentor stated: "Stakeholder engagement simply is key to good research. Stakeholder engagement forces those researchers who think they have all of the answers to stop and consider the perspectives and ideas of the target population of their proposed interventions. This collaboration leads to better design, implementation, and dissemination."

Strong mentor-mentee relationships are paramount.

3.3.4.2 Mentorship

- "Nothing happens without good mentors."
- "The most important part was dedicated space and time and mentorship."

As noted above, K Awardees and K12 Scholars overwhelmingly agreed that research mentorship was an essential component of their CER/PCOR career development. Likewise, in interviews with K12 PDs, all participants agreed that mentoring is a core component of training, with most interviewees stating that mentoring is the most important training component. Other respondents said that the K12 grant's support for interdisciplinary mentoring is important for CER/PCOR training. One said it is important for scholars to learn different perspectives from mentors in diverse stakeholder roles. The K12 program offers support for mentors to spend important time with junior faculty trainees.

In terms of the overall satisfaction of K Awardees and K12 Scholars with the mentoring they received during the AHRQ PCORTF career development training program—described in more depth under Evaluation Question 2 below—the vast majority (N=108, 87.8%) were either "very satisfied" or "satisfied." Notably, only five individuals were either "dissatisfied" (N=4) or "very dissatisfied" (N=1). As noted earlier in this report, among the small fraction of K Awardees and K12 Scholars whose interest in pursuing CER/PCOR declined over the course of the PCORTF career development training program, several were also individuals who reported being dissatisfied with their mentors. This again speaks to the critical importance of establishing effective and productive mentee-mentor relationships to achieve the intended outcomes of the program.

3.3.4.3 *Other Important Factors*

> ❖ "Because the grant supported trainees and mentors, it allowed significant time for individualized mentoring, which is critical for trainees' success."

Most of the responses to open-ended questions in the K Awardee/K12 Scholar Survey spoke to the value of the PCORTF career development training program in providing the needed protected time to start or expand their CER/PCOR research career.

In interviews with K12 PDs, all agreed that one of the most important factors of the program was the funding provided through PCORTF–TP that compensated scholar appointees. This gave them protected time to focus on learning the necessary skills, conduct initial independent CER/PCOR, and plan their careers without having to earn their livelihood through other means.

Mentored and experiential learning also provided K12 Scholars with opportunities to participate in the field, learn what is required to contribute to it, develop the skills and networks necessary to pursue careers in the field, and assess their own confidence and investment in the field based on experience. According to one K12 PD, the support from the grant gave scholar appointees important relief from the typical pressure on junior faculty to produce early in their careers, and time to develop the skills and experience necessary to pursue careers in CER/PCOR.

3.3.5 Evaluation Question 2

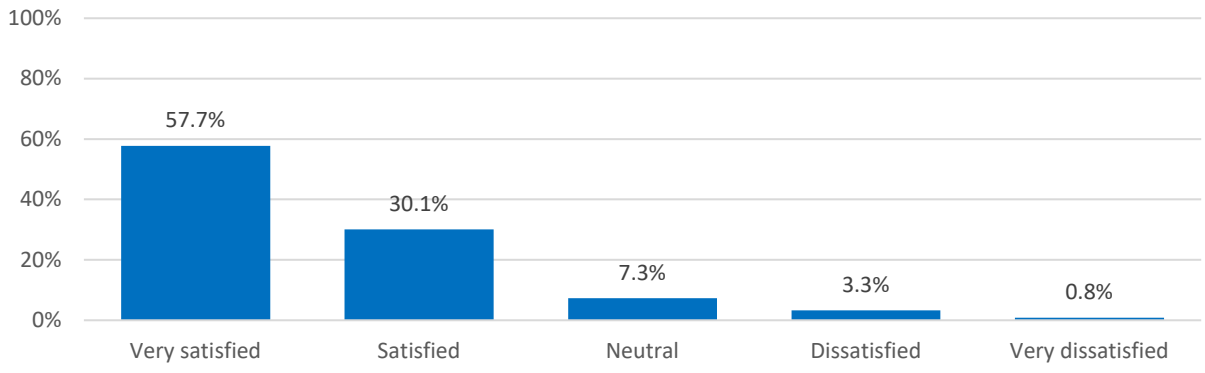
What is the experience of K Awardees and K12 Scholars with PCORTF–TP?

The overall and specific experiences of K Awardees, K12 Scholars, and mentors with the PCORTF career development training programs were captured through a series of survey questions, described in the subsections below.

3.3.5.1 *K Awardee and K12 Scholar Satisfaction with Mentoring Received*

K Awardees and K12 Scholars were asked to rate their overall satisfaction with the mentoring they received during the AHRQ PCORTF–TP K grant or K12 program. As shown in Figure 19, the vast majority (N=108, 87.8%) were either "very satisfied" or "satisfied." Notably, only five individuals were either "dissatisfied" (N=4, 3.3%) or "very dissatisfied" (N=1, 0.8%).

Figure 19: Overall K Awardee and K12 Scholar Satisfaction with Mentorship Received



Data Source: K Awardee/Scholar Survey

K Awardees and K12 Scholars also rated their satisfaction with the mentorship they received across seven core areas, for both their primary mentor and co-mentor (Table 25). Across all of the core areas

assessed, primary mentors received higher satisfaction ratings than did co-mentors. Likewise, when dissatisfaction was noted, it was also more common with primary mentors relative to co-mentors.

Table 25: K Awardee and K12 Scholar Satisfaction Across Core Mentorship Areas

Core Mentorship Areas	*Primary Mentor Very Satisfied/ Satisfied*	*Primary Mentor Dissatisfied/ Very Dissatisfied*	*Co-mentor Very Satisfied/ Satisfied*	*Co-Mentor Dissatisfied/ Very Dissatisfied*
The quality of communication (ex. frequency, content, usefulness, actionable guidance)	91.1%	3.3%	81.3%	3.3%
Mentoring in CER/PCOR	82.9%	3.3%	76.4%	4.1%
Support for career planning	82.1%	6.5%	71.5%	4.1%
Support for professional networking	78.0%	8.1%	67.5%	4.1%
Support for managing professional demands	76.4%	4.9%	67.5%	2.4%
Support for peer networking	74.8%	6.5%	62.6%	3.3%
Mentoring in how to apply for and obtain independent CER/PCOR grant funding	71.5%	5.7%	65.9%	3.3%

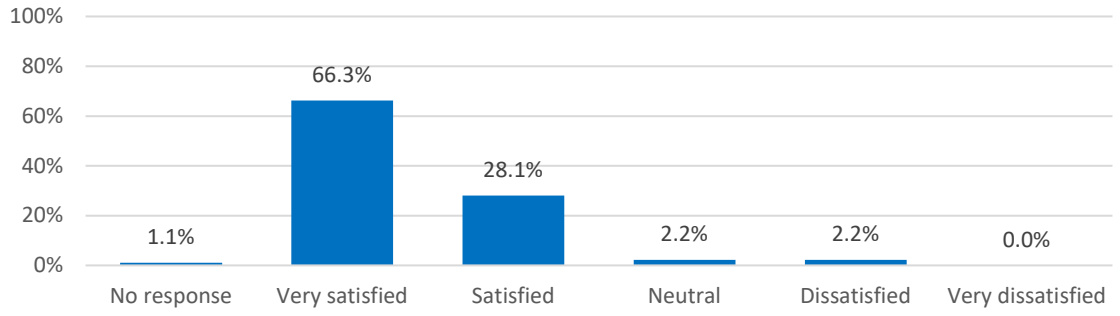
Data Source: K Awardee/Scholar Survey

The overall positive experience of K Awardees and K12 Scholars is also demonstrated by the proportion who indicated that their experience in the program had increased their interest in conducting CER/PCOR research and/or implementing it in their clinical practice, which was highlighted above. Likewise, a relatively high number of respondents (84.4%, N=103) indicated that they were likely to continue in a research career in the next 5 years, and to continue seeking CER/PCOR research funding.

3.3.5.2 Primary Mentor Satisfaction with Mentoring PCORTF Career Development Awardees

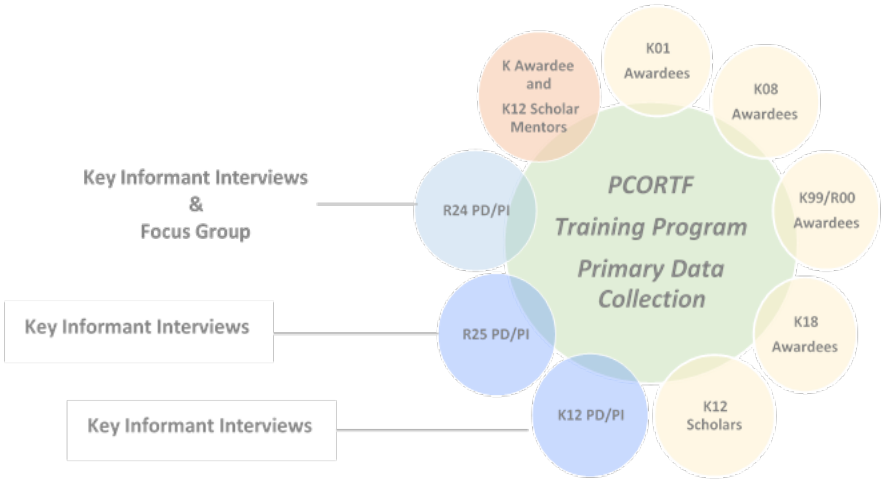
Primary mentors also rated their satisfaction with mentoring under PCORTF–TP (Figure 20). Similar to K Awardees and K12 Scholars, the overwhelming majority of mentors (94.4%) were either "satisfied" (28.1%, N=25) or "very satisfied" with the experience (66.3%, N=59). Among two individuals who said they were dissatisfied, one noted that it was because "the mentee left the program to take an FDA position after 8 years of training." The other stated that the negative experience was unique to a particular mentee and not characteristic of the mentor's experience with other CER/PCOR mentees. This mentor further noted that there was "nothing wrong with the program."

Figure 20: Mentor-Reported Overall Satisfaction with Mentorship Experience



Data Source: Mentor Survey

Mentored Institutional, Research Infrastructure, Research Education – K12, R24, R25



3.3.6 Evaluation Question 3

How have PCORTF–TP and partner institutions developed the capacity for PCOR training and mentoring, and in what ways is this sustainable?

Many mentors are committed to continuing mentoring in CER/PCOR regardless of whether they receive external funding support. However, external funding for both mentoring and training increases the time available to support CER/PCOR training.

3.3.6.1 CER/PCOR Infrastructure/Capacity Needs at Start of PCORTF–TP

K12 Grantees

- "The institution started with a fair amount of capacity. However, the grant provided a mechanism for central organization and focus of CER/PCOR activity."
- "The K12 funding allowed development of a systematic training program for cohorts of CER/PCOR trainees."

Data from final reports and key informant interviews conducted with K12 PIs/PDs elucidated institutional awardees' CER/PCOR infrastructure/capacity needs at the start of the program. PCORTF–TP grantees generally agreed that the core infrastructure elements required to conduct scholar training through the AHRQ PCORTF–TP K12 program were already in existence at their respective institutions (e.g., T32 grant programs). For example, one grantee noted his/her institution's approach to PCOR training was built around its existing AHRQ-funded pre- and postdoctoral training programs in health services research (HSR), a recently completed faculty development program in CER, and its long institutional record of developing health services and outcomes researchers. The K12 program funding allowed the institution to expand its

training specifically to CER/PCOR. Another grantee noted that funding for CER/PCOR training has been limited, and the AHRQ K12 program provided this needed support. Several K12 PDs noted that the period between completing a fellowship and winning a first grant is a "dangerous time," when intensive mentorship and support are critical. Without them, many people "fall through the cracks," and the AHRQ K12 grant supported scholars through this period while also cultivating their training in CER and PCOR.

- "The people and individuals with expertise that were recruited or trained using the R24 support remain after R24 funding ceased."
- "The program helped recruit the next generation of PCOR investigators from health professionals and scientists, at all levels of career development."

R24 Grantees

Grantees responding to the "Infrastructure Development Program in Patient-Centered Outcomes Research (PCOR) (R24)" were institutions with capacity to conduct general HSR that wanted to strengthen their institution's capacity to conduct CER/PCOR. In terms of their primary needs for building capacity to conduct CER/PCOR, R24 grantee interviewees noted that at the start of PCORTF–TP, their respective institutions were lacking campus-wide commitment and resources to support CER/PCOR across departments, research centers, and projects. All grantees emphasized that they needed to increase human capital through efforts such as training and recruitment. While most grantees reported that their institutions generally supported and hoped to increase capacity for CER/PCOR from the beginning of the grant period, two reported that increasing institutional awareness of and commitment to CER/PCOR and creating an institutional culture supportive of CER/PCOR values and practices, were central goals of the grant. Those grantees that reported having some institutional support and infrastructure prior to the grant also reported that infrastructure was needed to support aspects of PCOR that are distinct from CER and other related research, such as HSR.

All respondents identified training and mentoring as areas that required more infrastructure, with an emphasis on the value of mentoring. Over half of R24 grantees (N=4 of 7) reported that they needed infrastructure to support stakeholder engagement and partnership development. Two grantees reported a need for infrastructure to support increasing expertise in applying qualitative research methods. Two grantees reported a need to increase infrastructure to support informatics, including electronic health record (EHR) data extraction. Two grantees identified needs for pilot research support. One grantee reported a need for support in disseminating research findings in ways that facilitate practice change.

R25 Grantees

Different in many respects from the R24 mechanism, the "Researcher Training and Workforce Development in Methods and Standards for Conducting Patient-Centered Outcomes Research Studies (R25)" grant funding opportunity was intended to support grantees at varied institutions in developing and implementing researcher education programs centering on methodologies and methodological standards used to conduct CER/PCOR. R25 grantees worked to develop a broad range of training activities and programs, from basic to advanced, to accommodate a range of researcher skill levels and needs. These grants supported the development of educational programs based at five institutions that leveraged internal and external partnerships and collaborations with a variety of health systems and institutions to develop a diverse collection of CER/PCOR training programs to increase workforce CER/PCOR capacity.

The PCORTF–TP has developed a large core of researchers, most of whom are continuing the pursuit of newly-acquired advanced CER/PCOR skills and knowledge in the varied methods of this research, and have secured funding to support ongoing research.

3.3.6.2 CER/PCOR Infrastructure/Capacity for PCOR Training and Mentoring

Among R24 grants, consistent with their outlined goals, grantees developed intra-institutional and external partnerships to develop training and mentored research programs. Educational activities included seminars and webinars, PCOR certificate educational programs, online educational programs and resource hubs, and experiential mentored research fellowships/programs. R24 grantees reported recruiting and/or training staff who remained at the institution to support ongoing PCOR training and mentoring after the grants concluded.

Examples of Built Infrastructure

"The R24 allowed us to recruit key faculty, establish collaborations with institutions with expertise in areas we were lacking, create robust training programs to increase expertise in PCOR, and create infrastructure allowing for ongoing dialogue and collaboration with different stakeholders."

"[As a result of the R25,] we developed 48 basic training lectures, hosted on the EdX platform. Since the launch in 2018, over 8,300 participants from approximately 100 countries have participated, and 637 participants have received certificates of training completion."

R25 grantees likewise developed extensive collaborative research partnerships, developed a variety of educational resources, and implemented mentored research programs that yielded long-lasting capacity in the form of educated and trained faculty and researchers.

K12, R24, and R25 interviewees said that training scholars and researchers to become mentors is one of the most important ways that training contributes to CER/PCOR training and mentoring capacity. One interviewee pointed out that scholars retain core lessons and principles throughout their careers. Scholars have pursued careers in CER/PCOR, becoming leaders and emerging leaders in the field. They have become faculty, clinicians, and administrators. Many now serve at the institution that trained them. Others work elsewhere but continue to collaborate with faculty at the training institution. Scholars' continued work is an important component of sustained increased CER/PCOR capacity.

A K12 PD reported that winning a K12 award demonstrated to the institution's administrators that CER/PCOR is a viable field that can earn research support. This increased institutional support for hiring CER/PCOR faculty. Scholars' academic productivity and career success were consistently cited as reasons training and mentoring activities had been sustained. Several participants said the PCORTF grant facilitated networking and strengthened professional ties among institutional faculty and scholars, and among institutional faculty, scholars, and external partners. Below are some of the specific examples provided by grantees:

- An R24 project lead reported that engaging the grantee institution's administrators led to their ongoing referral of qualified researchers to participate in CER/PCOR training.
- An R24 grantee collaborated with other schools within his/her institution, resulting in $460,000 in matching funds.

- Partners of an R25 grantee are now applying for funding to conduct CER/PCOR, with skills they learned through collaboration with the grantee.
- An R25 grantee reported training 119 scholars, all of whom consistently reported a high level of confidence in applying CER/PCOR skills, and who collectively have published nearly 200 manuscripts.

CER/PCOR trainees are now serving as mentors to other researchers, which greatly expands on the initial investment of PCORTF–TP.

Awardees of PCORTF grant mechanisms reported that the grant funding has supported development of CER/PCOR curricula and training programs that have been sustained. Several reported that patient and community engagement mechanisms, such as stakeholder panels and patient advisory boards launched as a result of the PCOR training program, have been sustained.

3.3.7 Evaluation Question 4a

What infrastructure changes/enhancements were, or are expected to be, most impactful in expanding PCOR capacity?

R24 grantee focus group participants and interview participants generally concurred that an important effect of winning the PCORTF grant was that it identified CER/PCOR and training to conduct CER/PCOR as institutional priorities. The grant provided a mechanism for focusing, organizing, and managing CER/PCOR as a field studied at the institution. This supported recruiting, hiring, and retaining faculty experts; forming collaborative relationships with external partners; training new experts in the field; publishing CER/PCOR results; and transforming health systems.

K12, R24, and R25 PIs/PDs consistently identified mentoring and experiential training as the most important training activities for increasing participants' expertise. These activities also were the most sustainable because they depend more on faculty commitment and changes in institutional culture than material resources.

Below are some of the specific examples provided by grantees:

- A K12 grantee reported continued use of the CER/PCOR curriculum developed with grant support. The grantee institution has shared the curriculum with other institutions, which have also implemented it.
- An R24 grantee reported that the institution had lacked adequate faculty with CER/PCOR expertise prior to winning the grant. Grant funding allowed the institution to hire more faculty, which had "a major impact."
- An R25 grant team developed a PCOR track within the institution's Master's in Clinical Research program.
- An R25 team developed no-cost online training resources for systematic evidence review, which reach approximately 500 people monthly.

- Several grantees reported sustaining stakeholder advisory councils that had been formed with grant support.

3.3.8 Evaluation Question 4b

What types of professional development/training activities within a given institution were, or are expected to be, most successful in expanding the methodological expertise of faculty/research staff in conducting CER?

R24 Grantees

A variety of professional development and training activities were conducted by R24 grantees to expand institutional capacity for CER/PCOR. Some grantees reported that they had recruited new faculty and staff with PCOR and CER expertise as part of their efforts to expand their capacity. More often, extensive efforts were invested in expanding the capacity of existing faculty, trainees, and staff with advanced PCOR/CER training. This generally involved a combination of didactic and experiential training activities. Several R24 grantees cited hosting visiting professors with expertise in CER/PCOR who would conduct grand rounds and research and skills development workshops for faculty, scholars, and other trainees. Several grantees cited the development of PCOR and methodology-based courses that have continued even after the end of the grant funding. Faculty and scholars were also engaged to a great degree in mentored research activities. Institutions also provided ongoing CER/PCOR seminars and webinars to help researchers develop PCOR skills and knowledge.

Another element of professional development and capacity building was accomplished through the establishment of extensive partnerships with local/regional health systems and academic institutions, as well as patient communities and organizations.

- ✓ A number of these collaborations supported training and mentoring, but also were critical to developing data and analytic infrastructure.
- ✓ Patient advisory bodies were developed among several of the R24 grantees and supported ongoing professional development around patient engagement in PCOR research activities.
- ✓ Most grantees also reported developing collaborative partnerships between leading researchers, departments, and centers within their respective institutions to support training and research activities. Notably, these internal institutional partnerships were often cited as important for increasing awareness of and engagement in PCOR more broadly at the institutions.
- ✓ Moreover, the establishment of networks and partnerships was often cited by R24 grantees as critical to sustaining the PCOR programs established with AHRQ R24 PCORTF–TP grant support.

The R24 grantees also cited collaboration with other AHRQ PCORTF–TP R24 grantees, including monthly webinars and meetings, as important professional development, and networking opportunities.

3.3.9 Evaluation Question 4c

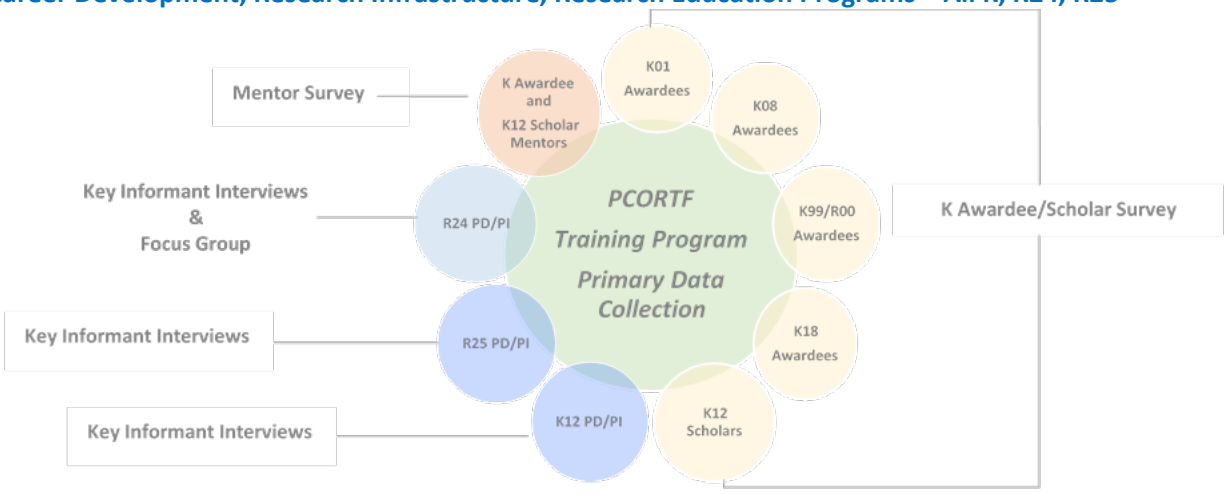
What infrastructure changes/enhancements were, or are expected to be, most impactful in expanding PCOR capacity?

All grantees reported that at least some training efforts were ongoing. For example, one institution reported that it had developed a Master of Science in Academic Medicine (MSAM) degree in an online format. This program continues to admit students from across the country in either the research track or educational/administrative track. Additionally, the same institution developed a Comparative Effectiveness Research course. Staff also incorporated PCOR into Clinical Research Methods I, a course in

the MSAM program curriculum. Another institution created an enduring course called Introduction to Patient-Centered Outcomes and Health Services Research.

All grantees also reported that they either had applied for or were in the process of applying for grant funding to continue their CER/PCOR training efforts. Two said that external funding is necessary to continue all of their training efforts. Most grantees indicated that their partnerships were ongoing.

Career Development, Research Infrastructure, Research Education Programs – All K, R24, R25



3.3.10 Evaluation Question 5

How have PCORTF–TP activities enhanced individual and institutional capacity to obtain CER/PCOR funding?

Key Informant Interviews and Focus Groups

Among key informant interviews with K12 and R24 grantees, several participants said that obtaining initial funding increases capacity to obtain additional funding. Some interviewees said that institutional administrations became willing to award intramural funds for CER/PCOR after their teams had won PCORTF funding. In addition, interviewees reported that scholars were better able to earn promotions and additional grant rewards as a result of participating in the PCORTF grant.

Interviewees and focus group participants reported that training in grantsmanship was popular with scholars and helped them to win independent funding. Participants also reported that partnerships often increase competitiveness for grant awards, and that teaching scholars how to develop and maintain partnerships was likely to increase their ability to earn additional grant and contract funding.

Below are some of the specific examples provided by grantees:

- A K12 PD reported that grantsmanship is a focus of training activities, and that approximately 80% of scholars successfully won Federal grants to conduct CER/PCOR research.
- A K12 PD reported that the PCORTF award was instrumental in winning a subsequent K12 grant from the National Heart, Lung, and Blood Institute.
- An R24 PI developed a scholar mentorship program to teach physician-scientists about PCOR and grantsmanship.
- An R24 grantee reported that the infrastructure developed with grant support allowed the grantee team to win an additional K12 grant and PCORI funding.
- One R25 course included a module on writing successful CER/PCOR grant proposals.

K Awardee/Scholar Survey

As described above under Section 3.3.3.7: Securing CER/PCOR Research Funds, an outcome indicative of success in PCORTF–TP is the ability of trainees and participating institutions to acquire additional funding. Respondents were asked about the number of both CER/PCOR and non-CER/PCOR grants they have received as a PD/PI since completing their AHRQ PCORTF–TP K grant or scholar appointment. Notably, close to 70% indicated that they had received one or more grants/contracts with a CER/PCOR focus, while 63% reported receiving one or more non-CER/PCOR-focused research grants/contracts since completing their AHRQ PCORTF–TP K grant or scholar appointment. A smaller proportion indicated having received no grants/contracts. However, a small percentage of respondents were still active in PCORTF–TP at the time of completing this survey.

3.3.11 Evaluation Question 6

How have PCORTF–TP investigators contributed to the PCOR field/PCOR capacity in the short term, and how are these contributions expected to enhance the field over the long term?

Based on participant responses in the K12, R24, and R25 interviews and the R24 focus group, trainees of these programs have pursued CER/PCOR careers, and are becoming leaders and mentors, which is expected to continue over the long term. As described throughout this report, trainees have independently won grant awards for CER/PCOR research, published research results, developed professional networks, and developed training resources. These foundational professional activities are steps toward long-term careers in which scholars generate additional funding and research, mentor new scholars, contribute to healthcare system transformation, and expand stakeholder engagement.

As shown in Table 26, the majority of K Awardee and K12 Scholar respondents (N=101, 82.1%) reported that they are currently active in ongoing CER and/or PCOR projects. Among these, 47 respondents (38.2%) said they conduct both CER/PCOR and general HSR. A total of 54 respondents (43.9%) indicated that their research is specifically focused on CER/PCOR, while only 17 respondents (13.8%) said their current research has no CER/PCOR focus. Just five respondents (4.1%) noted that they have no CER/PCOR or HSR research focus in their current work.

Table 26: K Awardee and K12 Scholar-Reported Current Research Focus

Current Research Focus	N	Percent
CER/PCOR Only	54	43.9%
Both CER/PCOR and General HSR	47	38.2%
HSR (Not CER/PCOR)	17	13.8%
Neither (Other)	5	4.1%

Data Source: K Awardee/Scholar Survey

More than a third of respondents (N=32, 43.2%) indicated they have sought R01 funding or other grant funding, followed by an additional eight respondents (10.8%) who have sought or received PCORI funding to conduct research. Thirty-one respondents (41.9%) indicated they were developing varied programs, toolkits, measures, and/or other interventions. Project topics ranged significantly.

3.3.12 Evaluation Question 7

Have grantees been effective at developing partnerships with organizations and stakeholders outside the grantee team and maintaining those partnerships in a sustainable way?

K12 programs established close collaborations with partner organizations, which often supplied candidate scholars and provided mentoring and access to clinical settings for the conduct of CER/PCOR.

Five of the seven R24 programs established close partnerships with external institutions, including with healthcare systems, advocacy organizations, payers, and others, to expand their CER/PCOR training, mentorship, and research capacity.

3.3.12.1 Institutional Partnerships and Engagement

Nearly all K12, R24, and R25 interviewees and R24 focus group participants reported that they had developed partnerships as part of their PCORTF–TP grant. These partnerships were both with other schools/divisions within an institution, and with other institutions, external organizations, and groups. For example, one R24 grantee reported actively engaging many different groups (e.g., the School of Journalism, the School of Social Work, health professions [e.g., nursing, physical therapy, occupational therapy], and departments of the Medical School).

Interviewees reported that partnerships are critical, and that knowing how to form them is a core CER/PCOR competency. They also reported that partnerships with patients, advocates, and community-based organizations are especially important for ensuring research is patient-centered. Academic partners can contribute to didactic and experiential training, offer expertise, and contribute to research capacity. Clinical, health system, and vendor partners facilitate intervention implementation and often contribute to training.

Only R25 representatives specifically discussed whether partnerships were ongoing. Only two of these respondents said this was the case. However, across the K12 CER/PCOR career development programs, K12 PD interviewees said they had trained scholars to form sustainable partnerships and had emphasized the importance of doing so. Two R24 grantees reported that they retained infrastructure for patient and community engagement that they had developed with grant support.

Below are some of the specific examples reported by grantees:

- One K12 PD reported ongoing collaboration with Veterans Affairs and the Group Health Research Institute, which have hired some K12 trainees.
- An R24 project lead reported ongoing community partnerships, with partners providing input on all presentations of the grantee's CER/PCOR findings.
- A K12 grantee collaborates with a network of safety-net clinics to implement CER/PCOR studies.

- An R25 grantee collaborated with the American Society of Clinical Oncologists to develop a webinar series.
- An R25 site developed the Expanding National Capacity for PCOR through Training (ENACT) Collaboration Network, a tuition-free program with a mission to support collaborative learning.

3.3.12.2 K12 Program Institutional Partnerships

K12 PDs were queried in interviews about whether their programs specifically involved collaborations/partnerships with other institutions, and the importance of these collaborations for the training of early career investigators in CER and/or PCOR. All but one interviewee reported collaborating with partners to implement the grant. Partners included the following:

- Universities (N=3)
- Hospitals (N=2)
- U.S. Department of Veterans Affairs (N=2)
- A network of safety-net clinics (N=1)
- Research institutes (N=1)
- Churches with primarily African American congregations (N=1)
- Advocacy groups (N=1)

K12 Partnership/Engagement Examples

"We partnered with the University of Alabama and the University of Chicago. We conducted joint symposia with the University of Chicago."

-Participating K12 Program Director

"Project Access works with community organizations to increase access to specialty care. We worked with them to get input from community organizations (e.g., black churches, Junta)."

-Participating K12 Program Director

Academic partners participated in educational activities, including developing symposia. They also shared in mentoring responsibilities. One grantee relied on academic partners to provide expertise on scholars' research projects. In some cases, academic partners referred scholars to training. Research institutes and some clinical partners also shared in mentoring and in offering training experiences. Some clinical partners provided support by delivering and implementing the services scholars assessed. Advocacy groups were partners in community and patient engagement.

K Awardees and K12 Scholars engaged a variety of stakeholders throughout their CER/PCOR career development activities and, by and large, report that they continue to engage stakeholders in their work. Individual K Awardees and K12 Scholars indicated that such engagement was critical to improving the design, execution, and dissemination of their research.

3.3.12.3 Stakeholder Engagement/Partnerships by K Awardees and K12 Scholars in Career Development

K Awardees and K12 Scholars were asked a series of questions related to stakeholder engagement and partnerships, including the types of stakeholders engaged, stakeholders' impact on their research and PCOR program experience, and their continued use of stakeholder engagement following the conclusion of their PCOR training experience.

Types of Stakeholders

As displayed in Table 27, respondents were asked about the stakeholders they engaged. The top three stakeholder groups identified were other researchers within the respondents' institution, clinical care providers, and patients and family members.

Table 27: Stakeholder Engagement During Award or Appointment

Stakeholders	N	Percent
Other researchers within my institution	99	80.5%
Clinical care providers	94	76.4%
Patients and family members	91	74.0%
Researchers from other academic institutions	86	69.9%
Community-based organizations	52	42.3%
Patient advocacy groups	49	39.8%
Information technology vendors/developers	30	24.4%
Federal, State, or local government programs	23	18.7%
Other	4	3.3%

Data Source: K Awardee/Scholar Survey

Engagement of Stakeholders

Two survey questions inquired about the use of varied PCOR stakeholder engagement methods both during and following the completion of the PCOR training program. Of note, K Awardees and K12 Scholars indicated that since completing their AHRQ PCORTF career development award/scholar appointment, the vast majority continue to engage these same stakeholders (Table 28). However, following conclusion of the training, K Awardees and K12 Scholars reported increased engagement with researchers from other academic institutions and with stakeholders to support research dissemination. The majority of respondents engaged more than one stakeholder group, with a mean of 3.7 (median=4).

Table 28: Stakeholder Engagement During and After Career Development

PCOR Methods	During *N=127 (%)*	After *N=106 (%*)*	Change
Engaging stakeholders in the formulation of research questions and the design of research projects	104 (84.6%)	81 (79.4%)	Decrease
Engaging stakeholders in research project implementation	90 (73.2%)	73 (71.6%)	Decrease
Collaboration with other institutions or research centers	81 (65.9%)	79 (77.5%)	Increase
Engaging stakeholders in research dissemination	63 (51.2%)	64 (62.7%)	Increase
None	2 (1.8%)	3 (2.9%)	Increase
Other	1 (0.8%)	1 (1.0%)	Increase

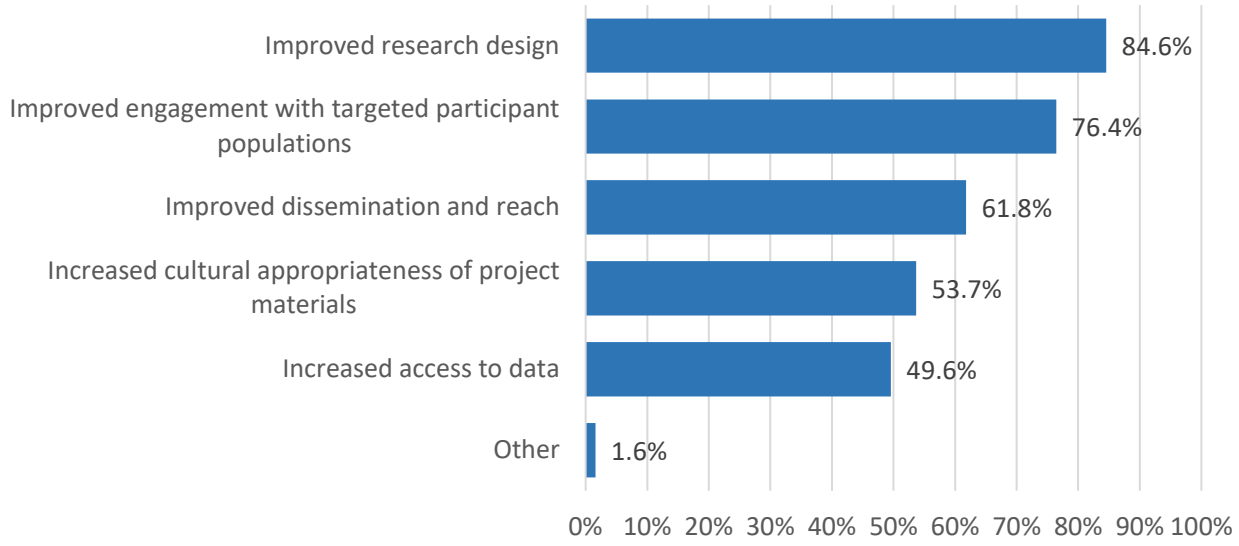
*Percentages exclude individuals who indicated that their K award or K12 scholar appointment is still active.

Data Source: K Awardee/Scholar Survey

3.3.12.4 Impact of Stakeholder Engagement for K Awardees and K12 Scholars

When K Awardees and K12 Scholars were asked about the impact of stakeholder engagement on their research, most agreed that engagement was critical for improving their research design (Figure 21). This was followed by improving engagement with targeted participant populations.

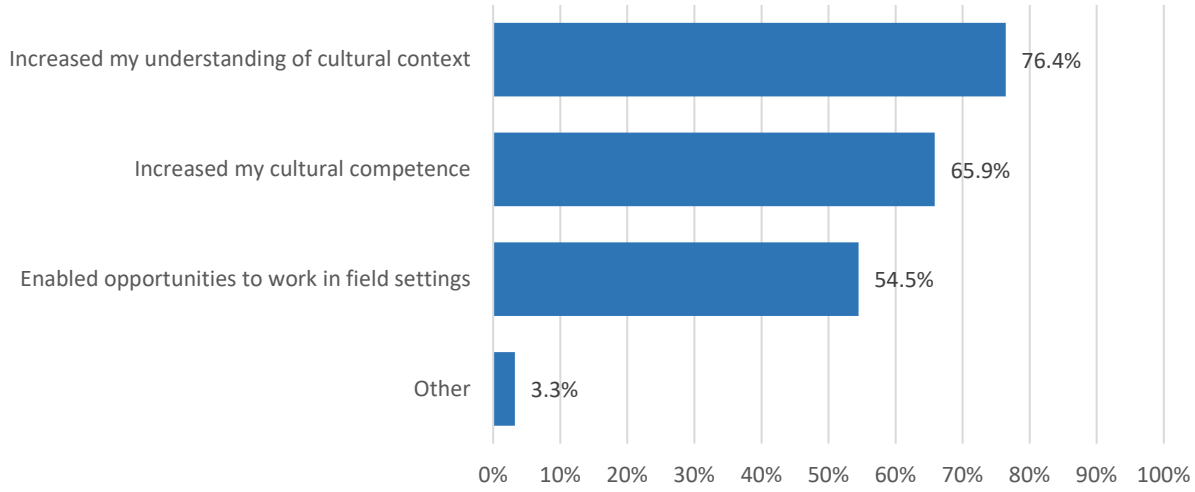
Figure 21: K Awardee and K12 Scholar-Reported Results of Stakeholder Engagement



Data Source: K Awardee/Scholar Survey

Related to the types of stakeholders engaged, respondents were asked to describe the impact of engaging stakeholders on their training experiences. The results are displayed in Figure 22. The top responses were increased cultural competence and increased understanding of cultural context.

Figure 22: K Awardee and K12 Scholar-Reported Impact of Stakeholder Engagement



Data Source: K Awardee/Scholar Survey

3.3.13 Evaluation Question 8

How have PCORTF–TP training activities and projects addressed health equity issues?

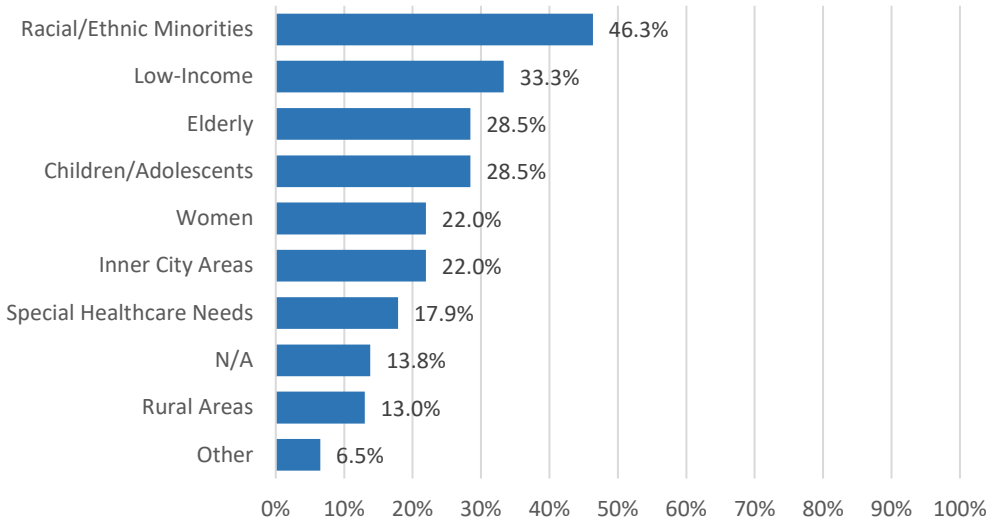
K Awardees and K12 Scholars

Across the AHRQ PCORTF career development K awards and K12 institutional awards, candidates were strongly encouraged in their applications to address research questions that would lead to reductions in specific and known disparities in healthcare outcomes and quality among racial and ethnic minority populations and underserved populations in addition to the use of novel stakeholder engagement and CER methodologies. The K Awardee/K12 Scholar Survey was used to assess the extent to which AHRQ priority populations and health equity issues were addressed across K awardee and K12 scholar research activities. Approximately half of survey respondents (N=64) indicated that their research had a specific disparities focus. K Awardees and K12 Scholars were also asked to identify specific AHRQ priority populations addressed by their research (Figure 23), and the ways their research worked to address health equity issues (Figure 24).

As shown in Figure 23, the largest proportion of respondents identified racial/ethnic minorities and low-income populations as a target for their research, along with other AHRQ priority populations. Only 13.8% indicated that an AHRQ priority population was not applicable to their work.

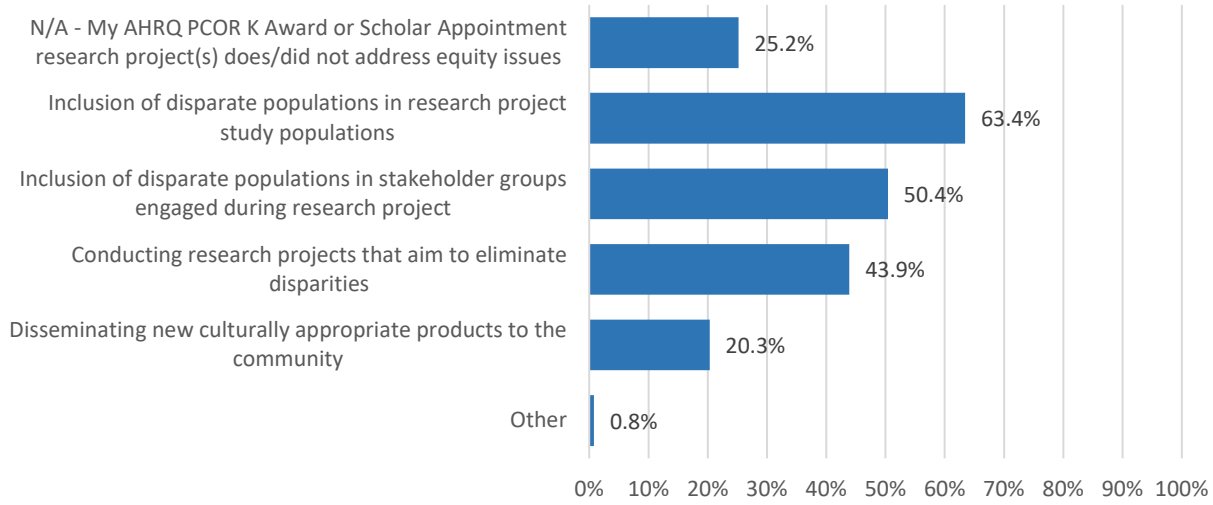
As shown in Figure 24, the primary way K awardee and K12 scholar projects worked to address equity issues involved the inclusion of disparate populations in their research activities. Close to 65% indicated that disparate populations were among the research study population, while 50% indicated that disparate populations were engaged as stakeholders during the conduct of their research projects. Notably, only 25.2% indicated that health equity was not a focus of their research. Thus, while not all of the research projects focused on disparities or health equity research questions per se, they often engaged diverse priority populations in the actual conduct of their research activities.

Figure 23: AHRQ Priority Populations Addressed by Award or Appointment Research Projects



Data Source: K Awardee/Scholar Survey

Figure 24: Ways in which Equity Was Addressed in Research Projects



Data Source: K Awardee/Scholar Survey

R24 and R25 Grantees

Among R24 and R25 grantees, the approach to increasing equity most frequently mentioned by interview and focus group participants was patient and community engagement. This is comparable to reports from career development K Awardees and K12 Scholars described above.

R24 and R25 grantees reported that engaging diverse patient and community advisors at all phases of research increases the degree to which researchers understand their perspectives, needs, and priorities, and conduct work that competently addresses these needs and priorities.

Several R24 PDs reported that some of their projects aim to improve safety-net health systems. Some R24 respondents reported that their work on the PCORTF grant included learning to develop culturally competent materials for community engagement. Some R24 respondents said that researchers should pay community advisors for their time. One R24 PD said that patient advisors' participation in research review committees "has had a huge effect on health disparities in our health system."

Some R25 project directors said that training minority scholars is an important approach to addressing health equity issues, but that they had not achieved their goals in this area. They suggested more support for outreach and training for minority scholars.

Below are some of the specific examples provided by grantees:

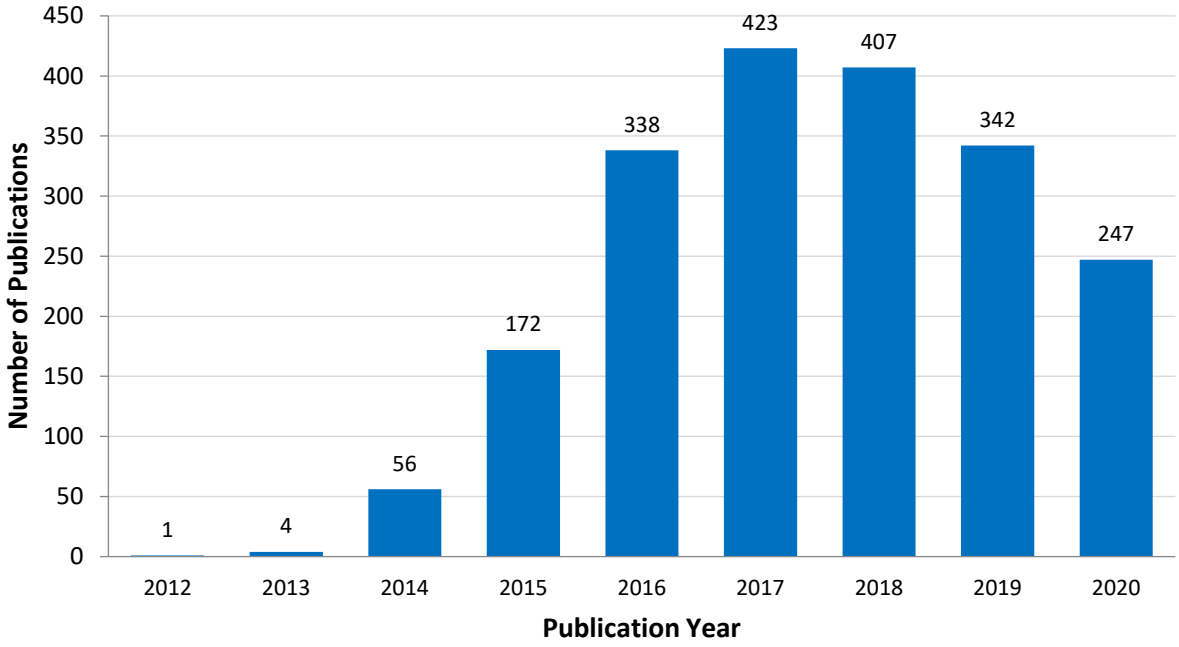
- An R24 grantee recruited and formed a community advisory panel for research, which is now supported by the university. One panel member, who is a patient from the community, conducts approximately quarterly seminars for medical students about serving in a safety-net hospital. This training is a direct result of R24 work.
- An R25 grantee focuses on training scholars at minority-serving institutions. Increasing minorities in the healthcare workforce is linked to minority patient engagement with healthcare and shared decision making.

4. Summary of Accomplishments

4.1 Publications

One measure of the success of PCORTF–TP, particularly among the K Awardees and K12 Scholars, and R24 infrastructure grants, is the publication and dissemination of CER/PCOR research. Based on a comprehensive bibliometric analysis, conducted in March 2021, the PCORTF–TP has supported a total of 1,990 publications since its inception in 2011 through the end of calendar year 2020. The number of publications by year is shown in Figure 25.

Figure 25: PCORTF–TP Publications by Year



Data Source: Bibliometric Analysis

No publications were identified in 2011, which is not unexpected given that the median time lag between the start of a grant to publication is 3 years. Peak publication output occurred in 2017 with 423 total publications issued. Note that publications are still being indexed for beyond 2020, and the total for this portfolio of research is likely not final. The vast majority of resulting publications (80.6%) were peer-reviewed research articles.

Table 29 highlights the key bibliometrics, grouped by PCORTF–TP overall, all K grants, all R grants, and each RFA/PA in aggregate.

Table 29: PCORTF–TP Grant and RFA/PA-level Bibliometrics

RFA/PA	Grant Type	Number of Grants	Number of Documents	Percentage of Total	Average Years from Grant Start to Pub	Times Cited	Percentage of Documents in Top 10%	Category Normalized Citation Impact
All	All	80	1990	-	3.30	23813	19.55	1.687
All K	All K	67	1649	82.9%	3.17	19370	20.01	1.751
All R	All R	12	343	17.2%	3.93	4447	17.20	1.370
RFA-HS-13-008	K12	10	884	44.4%	3.46	10272	21.04	1.621
PA-13-180	K08	21	416	20.9%	2.59	4899	20.43	2.292
PA-12-114	R24	7	336	16.9%	3.92	4429	17.26	1.385
PA-13-181	K01	8	115	5.8%	2.56	759	12.17	1.164
PAR-12-115	K18	15	84	4.2%	2.62	1134	11.90	1.152
RFA-HS-12-001	K12	5	66	3.3%	3.56	1255	21.21	1.414
RFA-HS-13-002	K99/R00	5	61	3.1%	3.90	705	27.87	1.935
RFA-HS-12-007	K99/R00	4	44	2.2%	3.97	586	18.18	1.851
RFA-HS-14-004	R25	5	7	0.4%	4.59	18	14.29	0.692

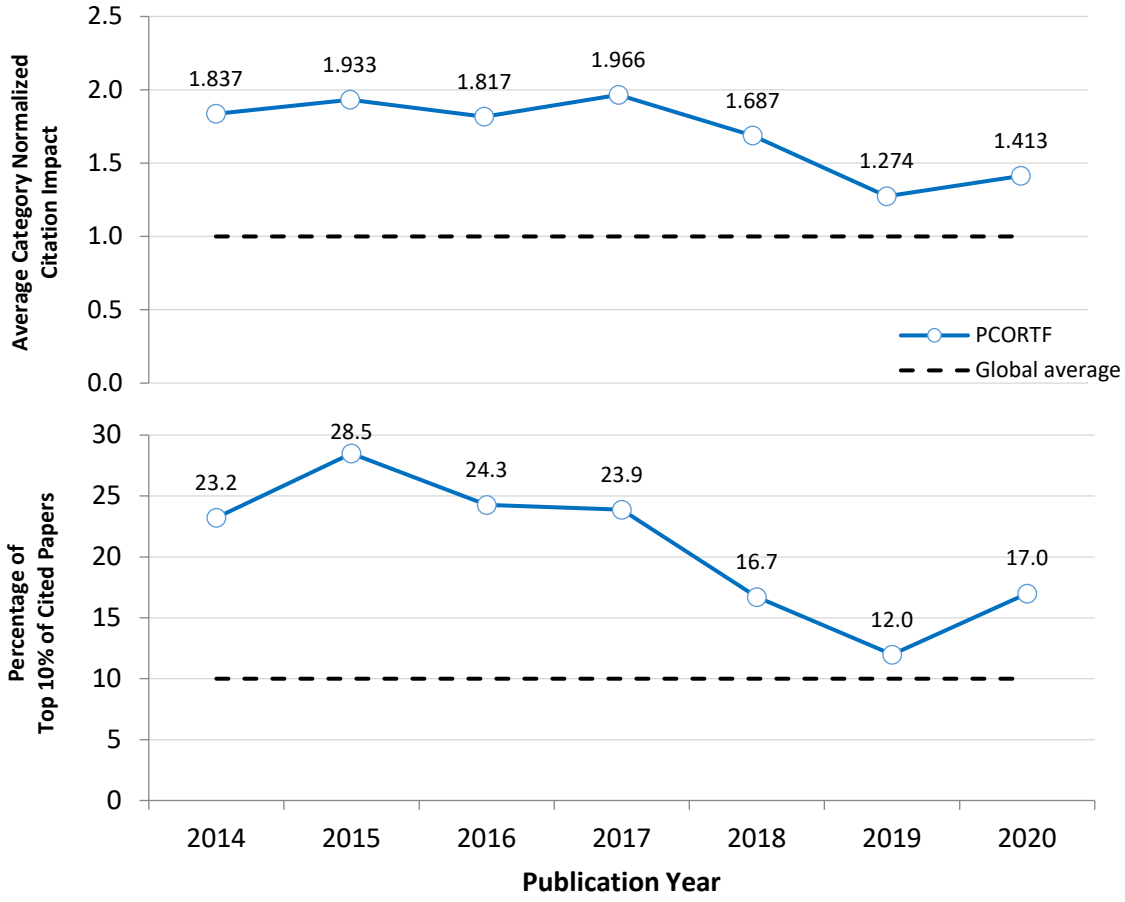
Data Source: Bibliometric Analysis

Of particular note, across PCORTF–TP, awardees and trainees consistently produced publications that perform above world average. The PCORTF–TP portfolio performance on the basis of two impact metrics is plotted over time in Figure 26. The comparisons begin in 2014 because there were too few PCORTF–TP publications in 2012-2013, which results in highly skewed data.

The top graph shows average Category Normalized Citation Impact (CNCI) for publications from each year. Overall, PCORTF–TP has an average CNCI of 1.69, 69% higher than the world average of 1.0, and the dataset performs above average throughout the years shown.

The bottom graph shows the percentage of the top 10% of cited papers occupied by publications in the PCORTF-TP portfolio (for the same Web of Science journal subject area and year). The PCORTF-TP dataset averages 20% of publications in the top 10% of cited papers—twice the world average of 10%. PCORTF-TP papers exceed the world average of 10% for all years.

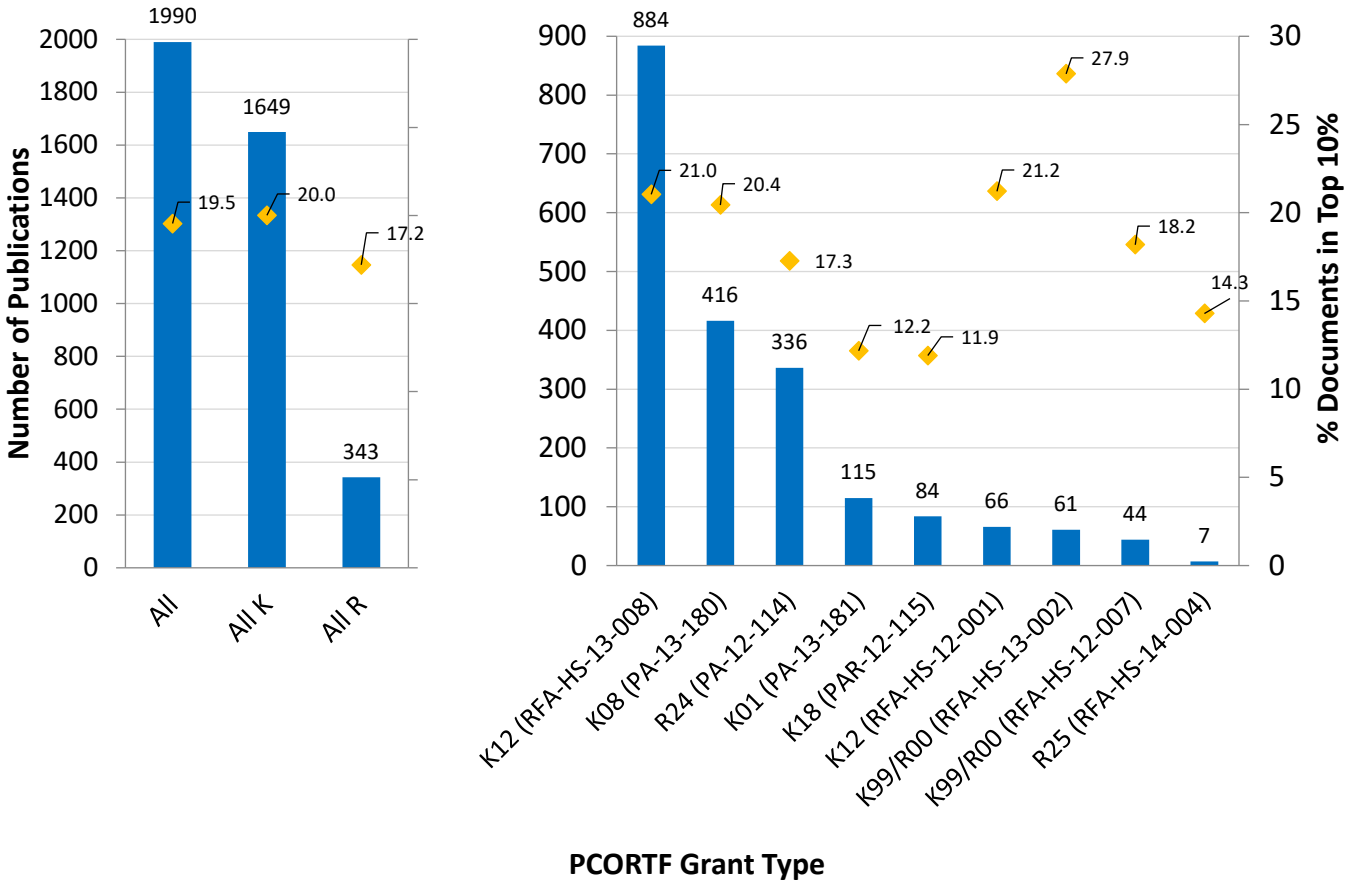
Figure 26: Publication Impact: Yearly Aggregated PCORTF–TP Publications



Data Source: Bibliometric Analysis

Given the differences in trainee participation rates across the RFA/PAs, investigating performance on a more granular level (i.e., by each RFA/PA mechanism) than grant type (i.e., K or R) is useful. The overall performance of the PCORTF–TP portfolio, all K and R grants, and each RFA/PA group is shown in Figure 27. Overall, about 20% of PCORTF–TP publications are in the top 10% of their field and year, which means the portfolio is about twice as impactful as an average collection of publications (which would be expected to be 10% in the top 10%).

Figure 27: Publication Impact: Rates of Documents in Top 10% by Grant Type



Data Source: Bibliometric Analysis

4.2 Additional Funding Acquired

Another outcome indicative of success in PCORTF–TP is the ability of trainees and participating institutions to acquire additional funding. This information was gleaned from multiple sources, including the K Awardee/K12 Scholar Survey, interviews with K12 PDs, and review of final reports.

As described under Section 3.3.3.7: Securing CER/PCOR Research Funds, close to 70% of the K Awardees and K12 scholar career development participants indicated that they had received one or more grants/contracts with a CER/PCOR focus since completing their AHRQ PCORTF–TP K grant or scholar appointment. This funding has derived from a variety of sources, including independent research grants (e.g., R01, R03), contracts, and training grants.

These results were echoed by interviews with K12 PDs and R24 PIs, and also indicated in annual and final progress reports. Examples are noted below.

- R24 Grantee – Its PCOR Center core faculty and scholars produced $18.5 million in PCOR-related follow-on grants. Among these, 10 PCOR scholars received external career development awards and other grants (R03, R21, R34, NCATS, Foundation grants) totaling $10.2 million.
- R24 Grantee – Its infrastructure capacity building supported grant applications that resulted in over $60 million in funding awards.
- K12 Grantee – Among its two cohorts of 10 scholars, eight secured Federal or foundation funding, and three received individual K awards.

- K12 Grantee – Among nine scholars, all have remained in academia, five have obtained individual career development awards from federally-funded institutions, and two have received R01 or R01-equivalent funding.

4.3 PCORTF–Training Program Participant Recommendations

PCORTF–TP participants agreed that AHRQ is in a unique position as a Federal agency that supports CER/PCOR and prioritizes expanding capacity and infrastructure. They strongly encouraged the Agency to continue the program as an important resource for improving healthcare quality in the United States. Grantees, K Awardees, K12 Scholars, and mentors offered recommendations regarding both program characteristics to maintain and program improvements.

Program Characteristics to Maintain

Participants identified several program characteristics to maintain. Across multiple mechanisms, grantees urged PCORTF–TP to continue to protect time for mentoring and training. Participants also advised the program to continue funding PCOR capacity building, as well as training in PCOR methods and principles. Participants agreed that mentoring is critical for effective training and that the program should continue to support it. They also agreed that training should continue to focus on core competencies, including patient engagement, interdisciplinary collaboration, pragmatic trials and rigorous qualitative methods, tailoring interventions for subpopulations, and dissemination science.

Program Improvements

Participants also suggested several ways to improve the program. Participants from multiple grant mechanisms called on the program to ensure that partnerships reported on grant applications are genuine, and to require grantees to monitor and document their progress, accomplishments, and lessons learned. Participants urged PCORTF–TP to provide opportunities for grant renewal and continuation, as well as for scholars and awardees to connect with other CER/PCOR professionals.

K mentors recommended that AHRQ facilitate collaboration and networking among grantees and develop and implement mechanisms for increasing the diversity of PCOR researchers. K Awardees and K12 Scholars advised PCORTF–TP to offer additional structured training related to CER/PCOR, and to provide mechanisms for identifying skilled, well-trained mentors. K mentors recommended that the program offer a grant mechanism designed to transition trainees to independent research careers.

R24 PDs advised PCORTF–TP to support training through all stages of career planning and development, and to allow flexibility in budgets and scheduling to accommodate requirements of academic institutions and key external partners. R24 PDs also recommended that AHRQ coordinate with the Patient-Centered Outcomes Research Institute (PCORI) to align funding priorities and requirements. They also advised the program to facilitate tailoring communication and dissemination efforts for priority audiences, through making this a priority for grantees and allocating resources to support communication and dissemination activities, including dissemination training. AHRQ also could identify stakeholder audiences for grantee findings.

R25 PDs recommended that PCORTF–TP align the grant schedule with academic scheduling requirements. R25 PDs also urged AHRQ to facilitate development of multidisciplinary research teams through mechanisms to ensure partnerships are authentic and committed.

5. Conclusion

Evaluation results suggest that AHRQ's PCORTF–Training Program has been successful at its core goal of increasing CER/PCOR capacity. Since inception, the program has trained hundreds of early and mid-career researchers and scholars and supported increased institutional infrastructure for CER/PCOR. PCORTF grant funding has supported mentoring, collaboration, community engagement, and faculty recruitment. These activities have contributed to 1,990 publications to date (which have consistently achieved higher-than-global-average impact scores), tools to support shared clinical decision making, CER/PCOR training curricula, and memoranda of understanding with partners representing diverse stakeholders. PCOR K Awardees and scholars, along with program mentors, credit PCORTF support with cultivating trainees' career development as CER/PCOR-informed researchers, clinicians, and administrators. Another important outcome has been trainees' and institutions' success in obtaining additional funding to support their ongoing CER/PCOR work. Many scholars have subsequently expanded CER/PCOR capacity by becoming mentors themselves. Grantees report that participation in the PCORTF program resulted in ongoing institutional support for CER/PCOR; ongoing academic, clinical, and community partnerships; and ongoing collaborative networks. Funded projects have yielded valuable findings about comparative effectiveness, patient engagement, cultural competence, health equity, and health system transformation.

Appendices:

A. K Awardee and K12 Scholar Appointee Survey
B. K Awardee and K12 Scholar Mentor Survey
C. K12 PD Key Informant Interview Guide
D. R25 Key Informant Interview Guide
E. R24 Key Informant Interview Guide
F. R24 Focus Group Guide

Appendix A: K Awardee and K12 Scholar Appointee Survey

AHRQ Patient-Centered Outcomes Research (PCOR) Trust Fund
Training Program Evaluation

Form Approved
OMB No. 0935-0250
Exp. Date 03/31/2023

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K Awardee and K12 Scholar Appointee Survey

Item	Question	Response Options
000	Dear AHRQ PCOR K Awardee or Scholar Appointee, The Agency for Healthcare Research and Quality (AHRQ) Patient-Centered Outcomes Research Trust Fund Training Program (PCORTF-TP) aimed to build capacity in the application of Comparative Effectiveness Research (CER) methods within the context of PCOR (CER/PCOR) through grant funding for research training and infrastructure development. AHRQ currently is coordinating with an independent evaluator (AFYA, Inc.) to assess PCORTF-TP processes and outcomes. Evaluation results will inform program planning and resource allocation. You are being asked to complete this survey because your experience as an awardee or scholar appointee provides important perspective regarding the PCORTF Training Program. This survey is a tool to help assess your experience with the program. It is estimated that it will take about 25 minutes to complete this survey. If you are unable to complete the survey in one sitting, you can save what you have completed and return to it later by clicking on the link that was provided. Your name or the name of your academic institution will not be identified in any reports or publications. Your responses will be kept confidential to the extent permitted by law, including AHRQ's confidentiality statute, 42 USC 299c-3(c). That law requires that information collected for research conducted or supported by AHRQ that identifies individuals or establishments be used only for the purpose for which it was supplied unless you consent to the use of the information for another purpose.	
000a	**Respondent ID** *Provided by Evaluation Team*	_____ [Respondent ID]
	Respondent Characteristics	
1.	What is your title at your primary institution or workplace?	
2.	How long have you been at your primary institution/workplace ?	☐ Under 1 year ☐ >1 year to 3 years ☐ >3 years to 5 years ☐ >5 years or more
3.	Which of the following best describes your current work? Select all that apply.	☐ Research with a CER/PCOR focus ☐ Health services research (without a CER/PCOR focus) ☐ Clinical practice ☐ Teaching ☐ Administration

Item	Question	Response Options	
		☐ Other (please specify)	
4.	How would you describe your current primary institution or workplace? Select all that apply.	☐ Academic institution ☐ Academic medical center ☐ Hospital or Ambulatory Care Clinic ☐ Behavioral health facility ☐ Foundation ☐ Non-Profit organization ☐ Private industry ☐ Professional society ☐ Federal government ☐ State or local government ☐ Other (please specify)	
	Training		
5.	For which AHRQ PCOR K Award Program(s) are/were you an award recipient? Select all that apply.	☐ **K01** - AHRQ Patient-Centered Outcomes Research (PCOR) Mentored Research Scientist Development Award ☐ **K08** - AHRQ Patient-Centered Outcomes Research (PCOR) Mentored Clinical Investigator Award ☐ **K18** - AHRQ Mentored Career Enhancement Award in Patient Centered Outcomes Research (PCOR) for Mid-Career and Senior Investigators ☐ **K99/R00** - AHRQ Patient Centered Outcomes Research (PCOR) Pathway to Independence Award ☐ **K12 Scholar Appointment** - AHRQ Patient Centered Outcomes Research (PCOR) Institutional Mentored Career Development Program	
6.	How long has it been since you completed your K grant training?	☐ Still active ☐ Under 1 year ☐ >1 year to 3 years ☐ >3 years to 5 years ☐ >5 years or more	
7.	At the start of your AHRQ PCOR K Award or Scholar Appointment, how would you describe your knowledge level related to **comparative effectiveness research (CER)** methods in general?	☐ Not knowledgeable ☐ Somewhat knowledgeable ☐ Knowledgeable ☐ Very knowledgeable	
8.	At the start of your AHRQ PCOR K Award or Scholar Appointment, how would you describe your knowledge level related to **patient-centered outcomes research (PCOR)** approaches in general?	☐ Not knowledgeable ☐ Somewhat knowledgeable ☐ Knowledgeable ☐ Very knowledgeable	
9.	To what extent were each of the following training formats	Research mentorship	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training

Item	Question	Response Options	
	employed to provide you with **CER** methods training during your AHRQ PCOR K Award or Scholar Appointment?		☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Clinical mentorship	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Webinars	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Workshops	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Coursework	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Research collaborations	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Community engagement activities	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
10.	Which **CER** training modalities/activities have you considered to be most important to effective training?	Research mentorship	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Clinical mentorship	☐ Not very important

Item	Question	Response Options	
			☐ Important ☐ Very important ☐ Essential ☐ N/A
		Webinars	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Workshops	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Coursework	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Research collaborations	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Community engagement activities	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
11.	To what extent were each of the following training formats employed to provide you with training on **PCOR** principles and approaches during your AHRQ PCOR K Award or Scholar Appointment?	Research mentorship	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Clinical mentorship	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Webinars	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Workshops	☐ At least monthly throughout training

Item	Question	Response Options	
			☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Coursework	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Research collaborations	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
		Community engagement activities	☐ At least monthly throughout training ☐ More than twice a year but less than monthly throughout training ☐ No more than twice a year throughout training ☐ Not at all ☐ N/A
12.	Which **PCOR** training modalities/activities have you considered to be most important for effective training?	Research mentorship	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Clinical mentorship	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Webinars	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Workshops	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Coursework	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A

Item	Question	Response Options	
		Research collaborations	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
		Community engagement activities	☐ Not very important ☐ Important ☐ Very important ☐ Essential ☐ N/A
	Mentorship		
13.	How did you select your primary mentor for your AHRQ PCOR K Award or Scholar Appointment? Select all that apply.	☐ Already affiliated with an institution with a strong CER/PCOR training program and access to qualified investigators who were available to serve as a primary mentor ☐ Referred to primary mentor by another mentor at my institution ☐ I had already started doing work with my primary mentor ☐ Other (please specify) _____	
14.	How did you select other investigators who served as your co-mentors for your AHRQ PCOR K Award or Scholar Appointment? Select all that apply.	☐ Already affiliated with an institution with a strong CER/PCOR training program and access to qualified investigators who agreed to serve as co-mentors ☐ Referred to co-mentor(s) by another mentor at my institution ☐ I had already started doing work with my co-mentor(s) ☐ Other (please specify) _____ ☐ N/A. There were no co-mentors for this AHRQ PCOR K Award or Scholar Appointment.	
15.	How satisfied were you with the following related to your primary mentor?	The quality of communication (ex. frequency, content, usefulness, actionable guidance).	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		The mentoring you received in CER/PCOR.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		The mentoring you received in how to apply for and obtain independent CER/PCOR grant funding.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		Your primary mentor's support for professional networking.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A

Item	Question	Response Options	
		Your primary mentor's support for peer networking.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		Your primary mentor's support for career planning.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		Your primary mentor's support for managing professional demands.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
16.	How satisfied were you with the following related to your co-mentors?	The quality of communication (ex. frequency, content, usefulness, actionable guidance)	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		The co-mentoring you received in CER/PCOR	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		The mentoring you received in how to apply for and obtain independent CER/PCOR grant funding.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		Your co-mentors' support for professional networking.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		Your co-mentors' support for peer networking.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		Your co-mentors' support for career planning.	☐ Very satisfied ☐ Satisfied

Item	Question	Response Options	
			☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
		Your co-mentors' support for managing professional demands.	☐ Very satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very dissatisfied ☐ N/A
17.	Overall, how satisfied were you with the mentoring you received?	☐ Very satisfied ☐ Satisfied ☐ Neither Satisfied nor Dissatisfied ☐ Dissatisfied ☐ Very dissatisfied	
18.	If dissatisfied or very dissatisfied, please say why.		

	Program Outcomes	***CER* Methods**	
19.	To what extent has the support you received as an AHRQ PCOR K Awardee or Scholar Appointee contributed to your knowledge and skills in each of the following **CER** methods/approaches?	Designing pragmatic clinical trials	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Conducting pragmatic clinical trials	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Integrating quantitative and qualitative data sources	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Identify gaps in the literature	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Conduct systematic literature/ evidence searches	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Conduct systematic evidence appraisal and data abstraction	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Conduct rigorous evidence	☐ To a great extent ☐ To a moderate extent

Item	Question	Response Options	
		synthesis and meta-analyses	☐ To a small extent ☐ Not at all ☐ N/A
		Using observational studies in the synthesis of evidence related to comparative effectiveness	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Using techniques to reduce confounding and potential bias inherent in observational studies	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Implementation science methodology	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Using registries and data mining techniques	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Conducting subgroup analyses to determine which treatments and interventions work best for specific populations	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
20.	To what extent did your training as an AHRQ PCOR K Awardee or Scholar Appointee strengthen your skills and use of the following **PCOR** principles?	Engaging stakeholders in the formulation of research questions and the design of research projects	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Engaging stakeholders in research project implementation	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Engaging stakeholders in research dissemination	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A

Item	Question	Response Options	
		Collaboration with other institutions or research centers capable	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
	Program Outcomes	***PCOR Principles***	
21.	Do you attribute achieving any of the following career landmarks to your receipt of the AHRQ PCOR K Award or Scholar Appointment? Select all that apply.	☐ Attainment of a faculty position ☐ Receipt of tenure ☐ Increased salary ☐ Receipt of additional research funding ☐ Receipt of additional research funding specifically to conduct CER/PCOR ☐ Publication of peer-reviewed articles and/or books ☐ Establishment of an independent health services research program ☐ Establishment of an independent CER/PCOR program ☐ Employment of additional researchers and support staff ☐ Receipt of professional honors or distinctions ☐ Service on editorial boards, peer review panels, advisory councils ☐ Appointment as department/division chair, dean, provost, president, or other leadership position ☐ Appointment as mentor to other researchers ☐ Other (please specify)	
22.	How have you applied CER/PCOR training to the research projects conducted as part your AHRQ PCOR K Award or Scholar Appointment? Select all that apply.	☐ Developed a plan for ongoing CER/PCOR research ☐ Applied for additional CER/PCOR research funding ☐ Conducted additional CER/PCOR research ☐ Served as a CER/PCOR mentor ☐ Professional work as a CER/PCOR clinical practitioner ☐ Other, please explain: _____	
23.	How has the training you received as an AHRQ PCOR K Award or Scholar Appointee influenced your career plans? Select all that apply.	☐ Decreased interest in conducting CER/PCOR research ☐ Increased interest in conducting CER/PCOR research ☐ Increased interest in implementing CER/PCOR in clinical practice ☐ Increased interest in mentoring others in CER/PCOR ☐ Other (specify)	
24.	What were your short-term goals when you started the program? Select all that apply.	☐ Gain specific knowledge and skills related to CER methods ☐ Gain specific knowledge and skills related to PCOR ☐ Expand on my CER research skills ☐ Expand on my PCOR research skills ☐ Improve my ability to secure future research funding ☐ Develop or improve research leadership and management skills ☐ Gain guidance and mentoring in health services research in general ☐ Author publications and presentations ☐ Other, please explain: _____	
25.	What were your long-term goals when you started the program? Select all that apply.	☐ Advance my research field of study in CER/PCOR ☐ Work in academia ☐ Obtain independent research position ☐ Obtain independent research position with a focus on CER/PCOR ☐ Obtain follow-up funding support in health services research ☐ Obtain follow-up funding support specifically related to CER/PCOR ☐ Improve the quality of patient care	

Item	Question	Response Options	
		☐ Other, please explain: _____	
26.	To what extent were you able to achieve the short-term and long-term goals that you set?	Short-term	☐ Exceeded all goals ☐ Completely ☐ Mostly ☐ Somewhat ☐ Not at all
		Long-term	☐ Exceeded all goals ☐ Completely ☐ Mostly ☐ Somewhat ☐ Not at all
27.	What new CER/PCOR related research, clinical, educational projects have you developed as a result of your participation in this training program?		
Item	**Question**	**Response Options**	
28.	To what extent do you think the AHRQ PCOR K Award or Scholar Appointment has enabled you to achieve or contribute to any of the following?	Advancement of CER/PCOR methods in your field of study	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Influence on another field	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Contributions to a systematic review	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Contributions to clinical, educational, or other guidelines or standards	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Contributions to laws or policies	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all

Item	Question	Response Options	
			☐ N/A
		Contributions to government reports	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Development of factsheets, newsletters or other educational materials	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Provision of expert testimony	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Development and testing of new or improved tools, devices, tests, measures, services, or screening approaches to identify, confirm, treat, or manage disease or disability	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Adoption of new or improved delivery methods for care or services	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
		Reduction in the cost of care or services	☐ To a great extent ☐ To a moderate extent ☐ To a small extent ☐ Not at all ☐ N/A
	Research		

Item	Question	Response Options
29.	What **CER methods** did you use for your AHRQ PCOR K Award or Scholar Appointment research work? Select all that apply.	☐ Pragmatic clinical trials ☐ Integrating quantitative and qualitative data sources ☐ Systematic literature/evidence searches ☐ Systematic evidence appraisal and data abstraction ☐ Rigorous evidence synthesis and meta-analyses ☐ Observational studies in the synthesis of evidence related to comparative effectiveness ☐ Techniques to reduce confounding and potential bias inherent in observational studies ☐ Implementation science methodology ☐ Analysis of registries and data mining techniques ☐ Subgroup analyses to determine which treatments and interventions work best for specific populations ☐ Other (please specify)
30.	What **PCOR components** were incorporated in your AHRQ PCOR K Award or Scholar Appointment research work? Select all that apply.	☐ Engaging stakeholders in the formulation of research questions and the design of research projects ☐ Engaging stakeholders in research project implementation ☐ Engaging stakeholders in research dissemination ☐ Collaboration with other institutions or research centers capable ☐ Other (please specify): ☐ None
31.	What **CER methods** have you used since completing your AHRQ PCOR K Award or Scholar Appointment? Select all that apply.	☐ Pragmatic clinical trials ☐ Integrating quantitative and qualitative data sources ☐ Systematic literature/evidence searches ☐ Systematic evidence appraisal and data abstraction ☐ Rigorous evidence synthesis and meta-analyses ☐ Observational studies in the synthesis of evidence related to comparative effectiveness ☐ Techniques to reduce confounding and potential bias inherent in observational studies ☐ Implementation science methodology ☐ Analysis of registries and data mining techniques ☐ Subgroup analyses to determine which treatments and interventions work best for specific populations ☐ Other (please specify) ☐ None ☐ N/A; my AHRQ PCOR K Award or Scholar appointment is still active. ☐ N/A; I no longer do research
32.	What **PCOR components** have you incorporated in your research since completing your AHRQ PCOR K Award or Scholar Appointment? Select all that apply.	☐ Engaging stakeholders in the formulation of research questions and the design of research projects ☐ Engaging stakeholders in research project implementation ☐ Engaging stakeholders in research dissemination ☐ Collaboration with other institutions or research centers capable ☐ Other (please specify); ☐ None ☐ N/A - My AHRQ PCOR K Award or Scholar appointment is still active. ☐ N/A - I no longer do research
	Stakeholder Engagement	
33.	What types of stakeholder groups did you engage during your research as an	☐ Other researchers within my institution ☐ Researchers from other academic institutions

Item	Question	Response Options
	AHRQ PCOR K Awardee or Scholar Appointee? Select all that apply.	☐ Clinical care providers ☐ Community-based organizations ☐ Patient advocacy groups ☐ Patients and family members ☐ Information technology vendors/developers ☐ Federal, state, local government programs ☐ Other (please specify)
34.	What types of stakeholder groups have you engaged for your research <u>since</u> completing your AHRQ PCOR K Award or Scholar Appointment? Select all that apply.	☐ Other researchers within my institution ☐ Researchers from other academic institutions ☐ Clinical care providers ☐ Community-based organizations ☐ Patient advocacy groups ☐ Patients and family members ☐ Information technology vendors/developers ☐ Other (please specify) ☐ None ☐ N/A - My AHRQ PCOR K Award or Scholar appointment is still active. ☐ N/A - I no longer do research
35.	What was the result of the interaction and collaboration with the stakeholder groups? Select all that apply.	☐ Improved research design ☐ Improved engagement with targeted participant populations ☐ Increased access to data ☐ Improved dissemination and reach ☐ Increased cultural appropriateness of project materials ☐ Other (please specify)
36.	How have stakeholder activities contributed to your training program experiences? Select all that apply.	☐ Increased my cultural competence ☐ Increased my understanding of cultural context ☐ Enabled opportunities to work in field settings ☐ Other (please specify)
	Disparities Focus	
37.	Does/did your AHRQ PCOR K Award or Scholar Appointment research project(s) have a health disparities focus?	☐ Yes ☐ No
38.	Which AHRQ priority populations are/were the focus of your AHRQ PCOR K Award or Scholar Appointment research project(s)? Select all that apply.	☐ Children/adolescents ☐ Elderly ☐ Low-Income ☐ Racial/Ethnic Minorities ☐ Rural Areas ☐ Inner City Areas ☐ Special Healthcare Needs ☐ Women ☐ Other (specify) ☐ N/A
39.	How does/did your AHRQ PCOR K Award or Scholar Appointment research project(s) address equity issues? Select all that apply.	☐ The conduct of research projects that aim to eliminate disparities ☐ Inclusion of disparate populations in research project study populations ☐ Inclusion in stakeholder groups engaged during research project ☐ Disseminate new culturally appropriate products to the community ☐ Other (specify)

Item	Question	Response Options
		☐ N/A - My AHRQ PCOR K Award or Scholar Appointment research project(s) does/did not address equity issues.
	Sustainability/ Future Career Plans	
40.	How likely are you to continue in a research career in the next five years? Select one.	☐ If you are no longer in a research career, please mark the box to the left then skip to question #41. ☐ For Very unlikely, please mark the box to the left and skip to question #42. ☐ For Somewhat unlikely, please mark the box to the left and skip to question #42. ☐ For Unsure, please mark the box to the left and skip to question #43. ☐ For Somewhat likely, please mark the box to the left. ☐ For Very likely, please mark the box to the left.
41.	Why did you leave your research career?	Please enter your response and skip to question #51.
42.	You indicated that you are unlikely or unsure about to continuing in a research career. Why?	Please enter your response.
43.	Since receiving your AHRQ PCOR K Award or Scholar Appointment, how many non-CER/PCOR research grants or contracts have you received as PD/PI? Select one.	☐ 0 ☐ 1-2 ☐ 3 or more
44.	Since completing your AHRQ PCOR K Award or Scholar Appointment, how many grants or contracts that build on CER/PCOR have you received as PD/PI? Select one.	☐ For 0 grants or contracts, please mark the box to the left and skip to question #47. ☐ For 1 to 2, please mark the box to the left. ☐ For 3 or more, please mark the box to the left.
45.	You indicated that since receiving your AHRQ PCOR K Award or Scholar Appointment, you have received grant or contract funding as PD/PI that builds on CER/PCOR. Please select the type of funding you received. Select all that apply.	☐ Independent Research grant (e.g., R01, R03, etc.) ☐ Research Programs Projects and Center Grants (e.g., P) ☐ Training grant (e.g., K, T) ☐ Cooperative agreement (e.g., U) ☐ Contract ☐ Other:
46.	What type of funding source administers the grant or contract you received?	☐ Federal Government ☐ State or Local Government ☐ University ☐ Foundation ☐ Industry ☐ Other:
47.	How likely are you to apply as PD/PI for more research grants or contracts that build on CER/PCOR? Select one.	☐ Very unlikely ☐ Somewhat unlikely ☐ Unsure ☐ For Somewhat likely, please mark the box to the left and skip to question #49. ☐ For Very likely, please mark the box to the left and skip to question #49.

Item	Question	Response Options
48.	You indicated that you are unlikely/unsure about applying for additional funding. Why?	Please enter your response and skip to question #51.
49.	For which of the following are you likely to apply?	☐ Independent Research grant (e.g., R01, R03, etc.) ☐ Research Programs Projects and Center Grants (e.g., P) ☐ Training grant (e.g., K, T) ☐ Cooperative agreement (e.g., U) ☐ Contract ☐ Other:
50.	What type of funding source administers the grant or contract opportunity you intend to pursue?	☐ Federal Government ☐ State or Local Government ☐ University ☐ Foundation ☐ Industry ☐ Other:
51.	Please provide any additional comments you have about the training program and research.	

For reference only.

K01	Career development (individuals with research doctoral degrees [e.g., PhD, ScD, DrPH]); minimum 75% time; sustained period of "protected time" (up to 5 years)
K08	Career development (individuals with clinical doctoral degrees or PhDs in clinical areas); minimum 75% time; sustained period of "protected time" (up to 5 years)
K18	Career development (mid-career and senior investigators); minimum 50% over 6-month to 1-year period to further develop their research expertise in PCOR methodologies
K99/R00	Pathway to Independence Award (postdoctoral candidates with less than 5 years research training for mentored K99 up to 2 years; followed by R00 independent research up to 3 years). Contains two components. Activation of the independent award phase is contingent upon the investigator securing an independent research position. The expected output of these grants is accelerated transition to tenure and productivity of PCOR researcher.
K12 Scholar	Career development (individuals with research doctoral degrees [e.g., PhD, ScD, DrPH]); full-time for 2-3 years for scholars; sustained period of "protected time" (up to 5 years for overall project)

Appendix B: K Awardee and K12 Scholar Mentor Survey

AHRQ Patient-Centered Outcomes Research (PCOR) Trust Fund
Training Program Evaluation

Form Approved
OMB No. 0935-0250
Exp. Date 03/31/2023

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K Awardee and K12 Scholar Mentor Survey

Item	Question	Response Options
000	Dear AHRQ PCOR K-Grant Mentor, The Agency for Healthcare Research and Quality (AHRQ) Patient-Centered Outcomes Research Trust Fund Training Program (PCORTF-TP) aimed to build capacity in the application of Comparative Effectiveness Research (CER) methods within the context of PCOR (CER/PCOR) through grant funding for research training and infrastructure development. AHRQ currently is coordinating with an independent evaluator (AFYA, Inc.) to assess PCORTF-TP processes and outcomes. Evaluation results will inform program planning and resource allocation. You are being asked to complete this survey because your experience as a K grant mentor provides an important perspective regarding the PCORTF Training Program. This survey is a tool to help assess your experience with the program. We estimate it will take about 30 minutes or less to complete. If you are unable to complete the survey in one sitting, you can save what you have completed and return later. We will not identify your name or the name of your academic institution in any reports or publications that use the information you provide. Your responses will be kept confidential to the extent permitted by law, including AHRQ's confidentiality statute, 42 USC 299c-3(c). That law requires that information collected for research conducted or supported by AHRQ that identifies individuals or establishments be used only for the purpose for which it was supplied unless you consent to the use of the information for another purpose.	
000a	**Respondent ID** *Provided by Evaluation Team*	_____ [Respondent ID]
	Respondent Characteristics	
1.	What is your title at your primary institution or workplace?	
2.	Which of the following best describes your work? Select all that apply.	☐ Research with a CER/PCOR focus ☐ Health services research (without a CER/PCOR focus) ☐ Clinical practice ☐ Teaching ☐ Administration ☐ Other (please specify)
	Training	
3.	Please select the AHRQ PCOR career development mechanism on which you have served as primary mentor.	☐ **K01** - AHRQ Patient-Centered Outcomes Research (PCOR) Mentored Research Scientist Development Award ☐ **K08** - AHRQ Patient-Centered Outcomes Research (PCOR) Mentored Clinical Investigator Award ☐ **K18** - AHRQ Mentored Career Enhancement Award in Patient Centered Outcomes Research (PCOR) for Mid-Career and Senior Investigators

Item	Question	Response Options
		☐ **K99/R00** - AHRQ Patient Centered Outcomes Research (PCOR) Pathway to Independence Award ☐ **K12 Scholar Appointment** - AHRQ Patient Centered Outcomes Research (PCOR) Institutional Mentored Career Development Program
4.	What were major factors that influenced your decision to serve as a primary mentor? (Please check all that apply)	☐ I want to share expertise on communication that facilitates shared decision-making. ☐ I want to share expertise on how health systems can facilitate shared decision-making. ☐ I want to share expertise on CER/PCOR research methods. ☐ I want to increase the number of clinician-researchers with CER/PCOR expertise. ☐ I want to increase the number of researchers with CER/PCOR expertise. ☐ I want to support improvement of individual health outcomes through CER/PCOR research. ☐ I want to support improvement of population health outcomes through CER/PCOR research. ☐ I have observed less than adequate clinical practice that could be improved through CER/PCOR. ☐ I have observed less than adequate healthcare delivery systems that could be improved through CER/PCOR. ☐ I believe my own clinical practice has improved as a result of CER/PCOR training. ☐ I believe my own research has improved as a result of CER/PCOR training. Other (please specify)
5.	How many mentees were you matched with as primary mentor?	☐ 1 ☐ 2 ☐ 3 or more
6.	How were you matched with the mentee(s) you mentored? (Select all that apply)	☐ Assigned by program ☐ Sought out mentee ☐ Referred to mentee ☐ Contacted by mentee ☐ Does not apply Other (specify)
7.	How many other similar research career-stage trainees (e.g., post-doc, junior faculty) have your mentored?	☐ 1-5 ☐ 6-10 ☐ more than 10
8.	How did mentoring a PCOR trainee differ from mentoring a non-PCOR trainee?	
9.	What types of training activities did your mentee(s) participate in during the AHRQ PCOR Career Development Award or K12 Training Program project period? Check all that apply.	☐ Instructional discussions with mentor ☐ Experiential research training with mentor ☐ Experiential training about applying CER/PCOR in clinical settings ☐ Webinars ☐ Workshops ☐ Coursework ☐ Research collaboration ☐ Community engagement activities Other (please specify)

Item	Question	Response Options	
10.	In general, what have you found to be the best modality for training in CER/PCOR? Check all that apply.	☐ Largely didactic (classroom based) ☐ Blended (didactic/experiential) ☐ Largely applied (supervised research project) ☐ Seminar series ☐ Journal clubs ☐ Other (please specify)	
11.	In which of the following ways have you contributed to fostering mentee(s)' CER/PCOR skills (check all that apply)?	☐ Worked with trainees to conceptualize and design research projects ☐ Supervised independent research projects ☐ Developed courses on CER/PCOR skills and applications ☐ Taught courses on CER/PCOR skills and applications ☐ Incorporated instruction in CER/PCOR into existing courses ☐ Conducted workshops/seminars on CER/PCOR skills and applications ☐ Referred trainees to work in other academic settings that provide opportunities to learn CER/PCOR skills ☐ Referred training to work in clinical settings outside the grantee institution to learn CER/PCOR skills ☐ Other (specify)_____	
	Program Outcomes		
12.	Which of the following are examples of targeted outcomes of your mentee(s)' training activities? (check all that apply)	☐ Increase trainees' knowledge about CER/PCOR purposes, methods, and outcomes ☐ Increase trainees' skills in CER/PCOR methodology ☐ Encourage implementation of targeted practices ☐ Increase trainees' engagement with stakeholders ☐ Increase trainees' adherence to PCOR principles ☐ Other (specify)	
13.	Did you create or modify courses as part of your K12 training work?	☐ For Yes, please mark the box to the left. ☐ For No, please mark the box to the left and skip to question #16. ☐ For Not Applicable (I did not serve as a K12 mentor), please mark the box to the left and skip to question #16.	
14.	If yes, please identify the titles of courses you created or modified as part of the AHRQ PCOR K12 Training Program.	**Course 1**	
		Course 2	
		Course 3	
		Course 4	
		Course 5	
		Course 6	
		Course 7	
		Course 8	
		Course 9	
		Course 10	
15.	Is the curricular content developed with your PCOR K12 Training grant program still available at your institution?	☐ Yes ☐ No (please explain/elaborate)	
16.	Please describe up to three of the most meaningful or impactful research products or publications from your mentee(s) under this AHRQ PCOR K Training Program grant	1. 2. 3.	
	CER/PCOR Methods		

Item	Question	Response Options
17.	Which CER methods do you consider to be most important for mentees/ scholars to learn?	☐ Designing pragmatic clinical trials ☐ Conducting pragmatic clinical trials ☐ Integrating quantitative and qualitative data sources ☐ Identify gaps in the literature ☐ Conduct systematic literature/ evidence searches ☐ Conduct systematic evidence appraisal and data abstraction ☐ Conduct rigorous evidence synthesis and meta-analyses ☐ Using observational studies in the synthesis of evidence related to comparative effectiveness ☐ Using techniques to reduce confounding and potential bias inherent in observational studies ☐ Implementation science methodology ☐ Using registries and data mining techniques ☐ Conducting subgroup analyses to determine which treatments and interventions work best for specific populations ☐ Other (Please describe)
18.	Please briefly explain why it is important for mentees to learn the CER methods selected above.	
19.	Which PCOR methods/strategies do you consider to be most important for mentees/scholars to learn?	☐ Engaging stakeholders in the formulation of research questions and the design of research projects ☐ Engaging stakeholders in research project implementation ☐ Engaging stakeholders in research dissemination ☐ Collaboration with other institutions or research centers capable ☐ Other (please describe)
20.	Please briefly explain why it is important for mentees to learn the PCOR methods/strategies selected above.	
	Other Program Feedback	
21.	Have you experienced challenges in mentoring K awardees/scholars in CER/PCOR?	☐ For Yes, please mark the box to the left. ☐ For No, please mark the box to the left and skip to question #23.
22.	Please describe up to 3 challenges you have experienced in mentoring K awardees/scholars under this AHRQ PCOR K Training Program grant.	1. 2. 3.
23.	Overall, how satisfied were you with the mentoring experience?	☐ For Very satisfied, please mark the box to the left and skip to question #25. ☐ For Satisfied, please mark the box to the left and skip to question #25. ☐ For Neutral, please mark the box to the left. ☐ For Dissatisfied, please mark the box to the left. ☐ For Very dissatisfied, please mark the box to the left. ☐ For Does not apply, please mark the box to the left.
24.	If dissatisfied, please indicate why.	
25.	Please provide any additional comments you would like to share.	

Appendix C: K12 PD Key Informant Interview Guide

Form Approved
OMB No. 0935-0250
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K12 Principal Investigator Key Informant Interview Guide

Date: _____
Grantee Institution: _____
Time Discussion Started: _____ Time Ended: _____

Introduction

Hello, my name is [moderator name], and I'll be conducting this interview. Thank you for agreeing to help us with this project. We appreciate your willingness to share your time and expertise. This interview is part of a larger evaluation that AHRQ is conducting to understand better the processes and outcomes of the Patient-Centered Outcomes Research Training Fund program. Your input will inform AHRQ's program planning and resource allocation as well as outcomes reporting. We expect the interview to take 45 to 60 minutes to complete.

Please note that we will be recording this session and [name of note-taker] will be taking notes. This helps ensure we adequately capture your feedback and ideas during the conversation. We're interested in hearing about your experiences, views, and opinions.

Know that any comments you make today will remain confidential to the extent permitted by law and your name will not be attached to anything you say. Also, please note that there are not any "right" or "wrong" answers. We want to know your opinions.

If at any time you are uncomfortable with my questions, you can choose not to answer; simply let me know that you prefer not to answer. Do you have any questions before we begin?

Interview Questions

Institutional need and impact

1. What influenced your decision to submit a grant application to AHRQ in response to the PCOR K12 funding opportunity?
2. How has the AHRQ K12 grant helped to expand CER/PCOR capacity at your institution? Also, more generally, the field as a whole?

Training activities and impact

3. What would you say is the value/importance of utilizing a mentor model in training early career investigators in CER/PCOR?
4. Did you participate in collaborations/partnerships with other institutions? If so, can you describe the importance of these collaborations for the training of early career investigators in CER and/or PCOR?
5. What do you think were this program's most important contributions in advancing scholar CER/PCOR knowledge, and why?
    - Prompt: Can you describe some of the most meaningful or impactful research products or scholar outcomes resulting from the K12 scholars training program?
6. Can you describe some key examples of how the K12 program expanded participating scholars' long-term career plans for conducting CER/PCOR?

Future planning and sustainability

7. What changes would you recommend making to this program to increase training program effectiveness in CER and/or PCOR for early career investigators?
8. What were some of the biggest challenges that you encountered in implementing the PCOR K12 program at your institution? How did you address these challenges?
9. What were some of the most important lessons-learned during program implementation?
10. Is your institution sustaining some of the program elements put in place under this grant? If so, please describe.

Conclusion

Is there anything else we haven't discussed yet that you think is important for AHRQ to know about the PCOR K12 program or what you recommend for the program in the future?

Do you have any questions for us?

This concludes our interview. Thank you for your time and input. AHRQ greatly appreciates your participation. If you have questions or comments later, please feel free to contact (evaluation contact) at (contact info), or (AHRQ contact) at (contact info).

Appendix D: R25 Key Informant Interview Guide

R25 Principal Investigator Key Informant Interview Guide

Date: _____
Grantee Institution: _____Time Discussion Started: _____Time Ended: ____

Hello, my name is [moderator name], and I'll be conducting this interview. Thank you for agreeing to help us with this project. We appreciate your willingness to share your time and expertise. This interview is part of a larger evaluation that AHRQ is conducting to understand better the processes and outcomes of the Patient-Centered Outcomes Research Training Fund program. Your input will inform AHRQ's program planning and resource allocation as well as outcomes reporting. Your responses may also inform evaluation data collection efforts. We expect the interview to take about 60 minutes to complete.

Please note that we will be recording this session and [name of note-taker] will be taking notes. This helps ensure we adequately capture your feedback and ideas during the conversation. We're interested in hearing about your experiences, views, and opinions.

Know that any comments you make today will remain confidential to the extent permitted by law and your name will not be attached to anything you say. Also, please note that there are not any "right" or "wrong" answers. We want to know your opinions.

If at any time you are uncomfortable with my questions, you can choose not to answer; simply let me know that you prefer not to answer. Do you have any questions before we begin?

Interview Questions

Scholar Training

1. Why do you think CER/PCOR researcher training and workforce development are needed?
    a. Do you think the R25 program's direct didactic training approach (versus, for instance, a traditional degree program or K12 program) is ideal for improving the CER/PCOR workforce? Why or why not?
2. What do you consider to be core competencies in CER/PCOR, and why?
3. Does your CER/PCOR training program require scholars to complete basic, advanced, and experiential components? Why, or why not?
    a. Which of these component programs do you believe to be most effective in developing CER/PCOR competence and why?
    b. What competencies do participants acquire at each of these levels of training?
    c. Among the basic and advanced activities your program offers, which CER/PCOR training modalities/activities (e.g., seminars, webinars, etc.) do you consider to be most effective, and why?
    d. Did your program have any unique or novel features, activities, etc.? Also, did participants receive continuing education credits for their respective professions upon completion? Did their participation count toward any certification programs?
4. What do you think are the best indicators of whether scholars have been adequately trained, and why?

Outcomes

5. Did your R25 program accomplish what you had initially planned in your original proposal? Please elaborate why or why not.

6. What would you consider to be the most meaningful or impactful training outcomes to result from this R25 program, and why?
7. How do you think your R25 grant has contributed to the CER/PCOR workforce?
    a. What types of data are available to demonstrate program impact? What types of evaluation data do you analyze, and how? What types of evaluation results have you obtained, and how are you using them?
    b. How important was it to assess trainees' CER/PCOR competencies mastery level? How frequent were assessments? How did assessment results inform program progression?
8. How do you think your R25 grant has helped your trainees' ability to apply CER/PCOR methods in their research or practice? What are some examples?

Recommendations

9. What changes would you recommend making to increase training program effectiveness?
    a. What level scholar (masters, doctoral, post doc) should participate?
    b. What prerequisites should be required?
    c. Is more outreach needed for diverse researchers?
    d. Any changes to curricular and/or training approaches? Does online training work better vs. face to face?)
10. Do you think the program should add additional training content on implementation? Dissemination? Any other areas? Why or why not?
11. What activities has your team participated in to ensure sustainability of the CER/PCOR training program? Which of these do you think are most effective, and why?

Closing

12. Is there anything else you would like to share regarding your experience with the R25 program?

Appendix E: R24 Key Informant Interview Guide

R24 Principal Investigator Key Informant Interview Guide

Date: _____
Grantee Institution: _____Time Discussion Started: _____Time Ended: ____

Hello, my name is [moderator name], and I'll be conducting this interview. Thank you for agreeing to help us with this project. We appreciate your willingness to share your time and expertise. This interview is part of a larger evaluation that AHRQ is conducting to understand better the processes and outcomes of the Patient-Centered Outcomes Research Training Fund program. Your input will inform AHRQ's program planning and resource allocation as well as outcomes reporting. Your responses may also inform evaluation data collection efforts. We expect the interview to take about 60 minutes to complete.

Please note that we will be recording this session and [name of note-taker] will be taking notes. This helps ensure we adequately capture your feedback and ideas during the conversation. We're interested in hearing about your experiences, views, and opinions.

Know that any comments you make today will remain confidential to the extent permitted by law and your name will not be attached to anything you say. Also, please note that there are not any "right" or "wrong" answers. We want to know your opinions.

If at any time you are uncomfortable with my questions, you can choose not to answer; simply let me know that you prefer not to answer. Do you have any questions before we begin?

Interview Questions

1. At the start of your R24 grant, what underlying institutional infrastructure components did your institution need to strengthen in order to support PCOR research? Prompts (Note: Following list is paraphrased from the "Infrastructure Development Core Plan" from FOA):
    - Office space for interdepartmental/interdisciplinary research centers
    - Computers and/or computer labs
    - Software
    - Faculty with CER expertise
    - Research staff with CER expertise
    - CER curriculum development skills
    - Opportunities for faculty and staff experiential training in CER
    - Intra-institutional multi-disciplinary partnerships
    - Inter-institutional multi-disciplinary partnerships
    - Infrastructure for disseminating products and research findings
    - Administrative and management processes to support development of a CER/PCOR program
    - Digital infrastructure for CER/PCOR
2. What factors would you say have most facilitated progress toward infrastructure development, and how have they facilitated progress?
3. What challenges have you addressed in developing infrastructure, and how?

4. How would you say the R24 Co-investigator pilot studies contributed to building CER/PCOR capacity?
5. What shared learning activities did your program or institution engage in as part of a learning collaborative that worked well and contributed to building CER/PCOR capacity? Prompt: cross R24 PI learning collaborative, seminar series, webinar series, etc.).

   [Background context: R24s had developed their own "learning collaborative" in terms of setting up regular meetings with the PDs and participating in a monthly webinar series (open to all R24 sites to participate; each site would host and present a methodological webinar and/or share project/program accomplishments)]
6. How would you say that the R24 grant has enhanced faculty CER/PCOR capacity?
7. How would you say that the R24 grant has enhanced your institution's capacity to obtain CER/PCOR funding? For example, have the outcomes from the research projects contributed towards new CER/PCOR funding? About how many new grants applications been submitted and how many awarded?
8. Has your R24 grant influenced your institution's priorities for sustaining CER/PCOR infrastructure and capacity building efforts at your institution? If so, which activities and how? If not, what were the barriers?
9. What types of stakeholders and organizations, including any advisory groups, have you developed partnerships with? How have partnerships impacted CER/PCOR capacity and accomplishments at your institution? (Prompts: Support outreach to vulnerable communities, support healthcare delivery system change, support development of faculty CER expertise, support experiential training, support dissemination).
10. Please describe your R24 grant related dissemination activities and their impact? What have been challenges for conducting these activities? What factors have facilitated these activities?
11. In general, how would you say your R24 grant has contributed to strengthening your institution's CER/PCOR infrastructure? (e.g., establishment of/ implementation of/; enhancement of listed prompts in #1 above? Other?)

Appendix F: R24 Focus Group Guide

R24 PI Focus Group Protocol

Thank you for participating in this focus group, which is a follow-up to individual interviews with R24 PIs. Before we start, I want to summarize key points you made during those interviews. Grantees agreed that the R24 grant has uniquely contributed to their institutions' CER/PCOR capacity. Major contributions included the opportunity to show that this infrastructure funding can lead to winning additional grant funding awards, facilitate recruiting and maintaining faculty with CER/PCOR expertise, and enable a focus on infrastructure rather than specific projects. The focus group questions aim to help us understand more details about the grant's role in your work, and the degree to which PIs' experiences were similar or different.

1. Are there any other ways that the grant supported capacity building? If so, what are they and how did they contribute to building CER/PCOR capacity at your institution?
2. How did participating in the R24 webinar series inform your CER/PCOR capacity building efforts and progress towards grant milestones at your institution?
3. During the interviews, grantees agreed that experiential learning and one-on-one mentoring were some of the most important training activities. What are important approaches and strategies for ensuring that these activities optimally support learning CER/PCOR?
4. What are some of the most important results of your dissemination activities? What factors have been barriers or facilitators to dissemination activities?
5. In what ways has the R24 grant resulted in increased capacity to support health systems change? Which activities most supported these results?
6. In what ways has the R24 grant resulted in increased capacity to address health disparities? Which activities most supported these results?
7. What are some lessons learned from directing your R24 CER/PCOR capacity building and infrastructure development grant?
8. During interviews, grantees indicated that pilot studies helped trainees' careers, but did not necessarily increase institutional capacity. If a similar CER/PCOR capacity building grant (R24) funding opportunity were to be offered again, would you recommend that a pilot study component also be included again? What pilot study requirements and implementation expectations would you recommend changing, and what would you recommend keeping the same?
9. Is there anything else you would like to share regarding your experience with the R24 program?