



AHRQ HEALTH INFORMATION TECHNOLOGY PORTFOLIO'S 2010 ANNUAL REPORT



Agency for Healthcare Research and Quality
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HEALTH IT

AHRQ Health Information Technology Portfolio's 2010 Annual Report

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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Health Information Technology (IT) Portfolio, sponsors a variety of contracts, grants, and cooperative agreements that examine the impact of health IT implementation and use on quality, safety, and other important health care outcomes. This annual report features 121 grant summaries and 59 contract summaries of AHRQ-managed health projects, as well as a summary of activities in the Health IT Portfolio in 2010.

AHRQ is most grateful to its contractors and grantees for their ongoing provision of timely, informative reports and their participation in this initiative to generate project summaries for calendar-year 2010.

We welcome comments on the utility of the summary of the Health IT Portfolio provided in this report and of the 180 Web-based project summaries. Comments may be sent by mail to Vera Rosenthal: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, or by e-mail to Vera.Rosenthal@AHRQ.hhs.gov.

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Report Acronym List

ACTION–Accelerating Change and Transformation in Organizations and Networks
AHRQ–Agency for Healthcare Research and Quality
ARRA–American Recovery and Reinvestment Act
ARRS–AHRQ Research Reporting System
ASQ–Ambulatory Safety and Quality Grant Initiative
CDS–clinical decision support
CERTs–Centers for Education and Research on Therapeutics
CMS–Centers for Medicare & Medicaid Services
CP3–Center for Primary Care, Prevention, and Clinical Partnerships
CPOE–computerized provider order entry
DHHS–Department of Health and Human Services
EHR–electronic health record
EQM–Enabling Quality Measurement through Health IT Grant Initiative
FOA–funding opportunity announcement
HIE–health information exchange
HIO–health information organization
IAA–interagency agreement
IQHIT–Improving Quality through Clinician Use of Health IT Grant Initiative
IRB–Institutional Review Board
MCP–Management of Individuals with Complex Healthcare Needs through Health IT Grant Initiative
NIH–National Institutes of Health
NRC–National Resource Center for Health Information Technology
OCKT–Office of Communications and Knowledge Transfer
ONC–Office of the National Coordinator for Health Information Technology
PA–program announcement
PBRN–Practice-Based Research Network
PCC–Enabling Patient-Centered Care through Health IT Grant Initiative
PEATOC–Program Evaluation and Analysis Task Order Contract
PHR–personal health record
PI–principal investigator
REC–regional extension center
RFA–request for application
RFP–requests for proposal
RFTO–request for task order
SEN–special emphasis notice
SRD–State and Regional Demonstration Project
TA–technical assistance
THQIT–Transforming Health Care Quality through Information Technology Program

Executive Summary

Research funded by the Agency for Healthcare Research and Quality (AHRQ) Health Information Technology (IT) Portfolio continues to contribute to efforts for improving health care nationwide by demonstrating health IT practices in various health care settings. The results present evidence on how health IT can ensure that medical information is available to appropriate individuals, in an understandable and actionable format, where and when it is needed. These projects generate evidence and insight that facilitate successful design, implementation, and use of health IT, and examine the impact of health IT use on changes in quality, safety, and improved health care outcomes.

To support its broad mission of improving the quality of health care for all Americans, the Agency has focused its health IT initiatives on the following three goals:

- Improve health care decisionmaking.
- Support patient-centered care.
- Improve medication management.

The projects funded through the Health IT Portfolio are conducted in real care delivery settings and identify the practical issues of implementing health IT to:

- Help clinicians provide safe, high quality health care.
- Put the patient at the center of health care.
- Inform the effective implementation of health IT, especially in underserved and under resourced areas.
- Evaluate costs and benefits of health IT.

The Health IT Portfolio works collaboratively with the other AHRQ Centers and Portfolios, as well as other Federal and outside partners.

Report Purpose

This Annual Report is designed to disseminate information on the research areas and progress at both the portfolio and project levels. The Portfolio is summarized by a number of broad categories of projects, including: Health IT Portfolio strategic goals, AHRQ business goals, funding mechanisms, geographic distribution, and lifetime funding as of 2010. The report also describes activities that took place throughout the year and synthesizes challenges, outputs, and successes of the 180 active projects. In addition, as part of the report, an individual project summary for each of the 121 grants and 59 contracts provides an overview of the project's long term objectives, status updates of the specific aims and objectives, and updates on completed or ongoing project activities. Lastly, the report also highlights the dissemination activities of the projects and the AHRQ Health IT team.

Report Organization and Availability

The report and individual project summaries are available as easy-to-access Web-based documents through the AHRQ-funded project search tool on the National Resource Center (NRC) Web site. The NRC

provides a platform to support outreach and delivery of information from AHRQ and to share expertise across the multidisciplinary fields that are engaged in critical aspects of health IT implementation and research. Users of the Web site can search for project summaries, project-related news, and project publications and can identify projects based on several categories, including type of technology, care setting, or target population.

2010 Annual Report Highlights

Projects represent a diverse range of technologies and care settings, and are geographically dispersed across the United States, including organizations in 36 States and the District of Columbia. The lifetime funding for these grants and contracts is \$103.6 million and \$71.8 million, respectively.

The AHRQ Health IT Portfolio staff, grantees, and contractors accomplished a variety of activities in 2010 that include:

- Completion of three of the six contracts supporting AHRQ's 5-year State and Regional Demonstrations in Health Information Technology, which support data sharing and exchange activities aimed at improving health care on a State or regional level and examine characteristics of health information organizations.
- Conclusion of the Transforming Healthcare Quality Through Information Technology (THQIT) grant implementation program, which demonstrated AHRQ's proactive focus on health IT implementation among rural hospitals and community-based health care settings.
- AHRQ's Annual Health IT Grantee and Contractor Meeting, held June 2-4 in Washington, D.C., which provided project officers, grantees, and contractors opportunities to gather and learn about the latest research in health IT.
- Synthesis and dissemination activities, by way of presentations at major conferences and meetings, marketing project results through press releases and newsletters, publications, and the NRC Web site.

The activities and achievements of the AHRQ Health IT Portfolio provide important contributions to the field of health IT. This research provides answers to the questions of how best to implement the technology and information on the expected patient outcomes. Evidence gaps, long an issue in health IT, are closing as a direct result of this funded work. The Portfolio's body of research represents some of the most important sources of evidence as to the impact of technology on improving quality, safety, effectiveness, and efficiency of health care. AHRQ's Health IT Portfolio team hopes that this work will serve as a catalyst for further research and collaborations across the research community in this field.

I. Introduction

The Agency for Healthcare Research and Quality (AHRQ) has developed the 2010 Health Information Technology Portfolio-Funded Annual Report to disseminate information on the Health Information Technology (IT) Portfolio. This report includes information related to the overall state of the Health IT Portfolio and projects funded by the Portfolio. As part of this effort, individual summaries were developed for the 180 “active” projects that were directly funded by the AHRQ Health IT Portfolio. For the purpose of this report, “active” is defined as ongoing for any time in calendar year 2010. The Health IT Portfolio is summarized by a number of broad categories of projects, including Health IT Portfolio strategic goals, AHRQ business goals, funding mechanisms, geographic distribution, and lifetime funding as of 2010. In addition, the report highlights the dissemination activities of the projects and the AHRQ Health IT team.

In order to provide the public with easy-to-access information, the report and individual project summaries are available as Web-based documents through the AHRQ-funded project search tool at the [National Resource Center \(NRC\) Web site](#). Users of the Web site can search for project summaries, project-related news, and project publications and can use multiple categories, including type of technology, care setting, and target population, to search for projects.

II. Background

A. Offices and Centers

AHRQ, part of the U.S. Department of Health and Human Services (DHHS), is the lead agency charged with supporting research designed to improve the quality of health care, reduce its cost, and broaden access to essential services. AHRQ's wide array of research brings practical, science-based information to medical practitioners, consumers, and other health care purchasers. The Agency is comprised of nine major offices and centers:

- [Center for Delivery, Organization, and Markets \(CDOM\)](#): CDOM is a locus of expertise and leadership for research on health care markets, delivery systems, and organizations.
- [Center for Financing, Access, and Cost Trends \(CFACT\)](#): CFACT conducts, supports, and manages studies of the cost and financing of health care, access to health care services, and related trends. CFACT's studies and data development activities support policy and behavioral research by providing health care leaders and policymakers with information and tools to improve decisions on health care financing, access, coverage, and cost.
- [Center for Outcomes and Evidence \(COE\)](#): COE conducts and supports research and assessment of health care practices, technologies, processes, and systems.
- [Center for Primary Care, Prevention, and Clinical Partnerships \(CP3\)](#): CP3 expands the knowledge base for clinical providers and patients and ensures the translation of new knowledge and systems improvement into primary care practices. CP3 supports and conducts research to improve the access, effectiveness, and quality of primary and preventive health care services.
- [Center for Quality Improvement and Patient Safety \(CQuIPS\)](#): CQuIPS improves the quality and safety of all Americans through strategic partnerships and collaborations with stakeholders across the health care system to implement evidence-based practices.
- [Office of Communications and Knowledge Transfer \(OCKT\)](#): OCKT promotes the communication of information to both internal and external customers. It designs, develops, implements, and manages programs for disseminating and implementing the results of Agency activities that have the goal of changing audience behavior.
- [Office of the Director \(OD\)](#): OD directs the research, research training programs, and dissemination activities of AHRQ to ensure the achievement of strategic objectives.
- [Office of Extramural Research, Education, and Priority Populations \(OEREP\)](#): OEREP directs the scientific review process for grants and Small Business Innovation Research contracts, manages Agency research training programs, evaluates the scientific contribution of proposed and ongoing research, demonstrations, and evaluations, and supports and conducts health services research on priority populations.
- [Office of Performance, Accountability, Resources, and Technology \(OPART\)](#): OPART directs and coordinates Agency-wide program planning and evaluation activities and administrative operations.

B. Portfolios

In addition to the offices and centers, AHRQ supports a series of interrelated health services research programs that individually and

collectively seek to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. In 2010, all funded projects were organized into six AHRQ portfolios: Health IT, Comparative Effectiveness, Innovations and Emerging Issues, Patient Safety Research, Prevention and Care Management, and Value Research.



- Health IT: The primary focus of this portfolio is to identify challenges to health IT adoption and use, solutions and best practices for making health IT work, and tools that will help hospitals and clinicians successfully incorporate new health IT.
- Comparative Effectiveness: The goal of this portfolio is to support high-quality research to help patients, health care providers (including nurses, doctors, and other clinicians), and policymakers to make evidence-based health decisions.
- Innovations and Emerging Issues: This portfolio focuses on identifying and supporting novel research that spans a diverse array of disciplines and has the potential to accelerate improvements in the organization, delivery, and management of health care.
- Patient Safety Research: The primary focus of this portfolio is to produce research on the scope and impact of medical errors, the root causes of threats to patient safety, and

effective ways to make system-level changes to help prevent errors.

- Prevention and Care Management: The objective of this portfolio is to translate evidence-based knowledge into current recommendations for clinical preventive services that are implemented as part of routine clinical practice to improve the health of all Americans, and to research approaches to improve care and reduce disparities for common chronic conditions such as diabetes, asthma, and heart disease.
- Value Research: This portfolio aims to facilitate research related to the Value-Driven Healthcare Initiative and the Health Insurance Decision Tool, which provides an integrated set of decision tools to assist States in the development of innovative programs that are consistent with the President's goal to provide basic health insurance at an affordable price.

To view funding opportunities across the AHRQ Portfolios:

- Go to [AHRQ's homepage](#)
- Select "Funding Opportunities," located on the left side menu

The Health IT Portfolio

P. Jon White, M.D., Director of the Health IT Portfolio, works with a core team of 10 employees. Additional AHRQ staff, including staff from the previously described offices and centers, serve as program officials to support the Portfolio's activities. Health IT staff members also work collaboratively with staff from other AHRQ offices and portfolios, particularly OCKT, to disseminate information from various health IT endeavors.

The Health IT Portfolio strives to fund and develop the best evidence about health IT adoption and use, solutions, and best practices for making health IT work, and tools that will help hospitals and clinicians successfully incorporate new information technology. To be effective, health IT must be appropriately designed, evaluated, implemented, and used. Interoperable health IT infrastructure has the potential to lower costs, reduce medical errors, improve the quality of care, and provide patients and physicians with new ways to communicate. The Health IT Portfolio also aims, through evidence-based research, to elucidate and disseminate information about the opportunities and challenges related to health IT development, implementation, and adoption.

The AHRQ Health IT Portfolio accomplished a variety of activities in 2010 including:

- Completion of three of the six multi-year State and Regional Demonstrations (SRD) in Health Information Technology contracts. A report prepared by RTI International, [Lessons Learned from AHRQ's State and Regional Demonstrations in Health Information Technology](#), describes the experiences of all the SRD contracts.



- Conclusion of the 118 “Transforming Healthcare Quality through Information Technology (THQIT)” grants. Through a contract with Mathematica Policy

Research, AHRQ is surveying the THQIT grantees and synthesizing the evidence and lessons learned from the program. As part of this work, eight [case summaries](#) were developed, all of

which represent the positive potential of a diverse set of technologies and applications. The summaries also point to some issues and challenges that must be addressed to realize the potential more broadly.

- Development of a summary report by the Center for Quality and Productivity Improvement at the University of Wisconsin-Madison, [Incorporating Health IT into Workflow Redesign](#), synthesizing existing research and evidence related to the impact of health IT on workflow in outpatient settings.
- Hosting of the [2010 AHRQ Health IT Grantee and Contractor Conference](#) June 2 through June 4 in Washington, D.C. This meeting was an opportunity for AHRQ health IT project officers, grantees, and contractors to gather together and learn about the latest research in health IT, share lessons learned, and build off each others’ work. This meeting also provided grantees and contractors with the opportunity to share their preliminary research findings and any tools that may be helpful to others.

Throughout the year, members of the Health IT Portfolio participated in and spoke at various conferences and meetings including:

- The [AHRQ 2010 Annual Conference: Better Care, Better Health: Delivering on Quality for All Americans](#) in September 2010.
- The Academy Health Annual Research Meeting in June 2010.



- The Healthcare Information and Management Systems Society (HIMSS) Annual Meeting in March 2010.

For more information on these activities, please see Section IV *Dissemination*.



Portfolio staff also partnered with Federal and private organizations to co-sponsor conferences, provide funding for projects, and share information. Partners included the Health Resources and Services Administration (HRSA), the Indian Health Service (IHS), the Centers for Medicare & Medicaid Services (CMS), Kaiser Permanente, the Commonwealth Fund, and the Robert Wood Johnson Foundation.

Through one of these partnerships, members of the Health IT team also served as program officials for American Recovery and Reinvestment Act (ARRA) contracts funded by the Office of the National Coordinator (ONC), helping with projects designed to improve quality of health IT and advance the concept of meaningful use. In collaboration with ONC, AHRQ is developing the national Health Information Technology Research Center (HITRC) using the NRC as a contracting mechanism. The purposes of the HITRC are to:

- Provide a forum for the exchange of knowledge and experience; accelerate the transfer of lessons learned from existing public and private sector initiatives, including those currently receiving Federal financial support.
- Assemble, analyze, and widely disseminate evidence and experience related to the adoption, implementation, and effective use of health IT that allows for the electronic exchange and use of health information.

- Provide technical assistance for the establishment and evaluation of regional and local health information networks to facilitate the electronic exchange of information across health care settings and improve the quality of health care.
- Provide technical assistance for the development and dissemination of solutions to barriers to the exchange of electronic health information, and learn about effective strategies to adopt and utilize health IT in medically underserved communities.

As of October 2010, there were 13 task orders awarded through the HITRC initiative.

C. Project Classification

Each of the Health IT Portfolio-funded grants and contracts is categorized into one of three health IT strategic goals, and one of three AHRQ business goals. These goals are listed below, along with examples of projects from the Health IT Portfolio that illustrate various efforts toward achieving those goals.

Health IT Strategic Goals

- **Improved Decisionmaking:** Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.



The [*Guidelines into Decision Support \(GLIDES\)*](#) project, led by Dr. Richard Shiffman (Contract Number 290-08-10011), represents a study that has improved decisionmaking as its strategic goal. The team is developing, implementing, and evaluating projects that will advance the understanding of how best to incorporate clinical decision support (CDS) into health care delivery. By incorporating CDS into electronic health records (EHRs) and assessing the benefits and drawbacks, a set of recommended methods will be developed to help clinical organizations across the country efficiently and effectively implement CDS.

- **Patient-Centered Care (PCC) or Health Information Exchange (HIE):** Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions in care settings, and the use of electronic exchange of health information to improve quality of care.

[*Improving Health Care Quality through Health Information Technology for People with Intellectual Disability*](#), led by Dr. James Howard Rimmer (Grant Number R21 HS 018766), exemplifies a project with PCC as its strategic goal. The project addresses the lack of care continuity for people with intellectual disabilities (ID) by adapting and testing a personal health record (PHR) to specifically meet the needs of people with ID. The PHR-ID will enable longitudinal data on people with ID to be accessed by caregivers and health care providers, as well as functionality to provide alerts for action items established in a patient's care plan.

The [*HIE and Ambulatory Test Utilization*](#) project is led by Dr. Stephen Ross (Grant Number R21 HS 018749) and illustrates a project with the HIE strategic goal. The project is looking at whether adoption of a community-

wide HIE is associated with a reduction in utilization of laboratory and radiology testing. By conducting a retrospective pre-post comparison of providers, the study team is assessing whether or not the regional HIE system helped doctors provide more efficient medical care.

- **Medication Management:**

Develop and disseminate health IT evidence and evidence-



based tools to improve the quality and safety of medication management via the integration and utilization of medication management systems and technologies.

The [*Computer Assisted Medication and Patient Information Interface*](#) project, led by Dr. David Ziemer (Grant Number R21 HS 018236), is an example of the medication management strategic goal. The project team is developing and testing a tool to improve and standardize the flow of information between patients with type 2 diabetes and providers, with the aim to improve treatment outcomes and reduce complications. The provider interface will support medication management functions, including correcting incoming medication data, entering new drug regimens, printing medication instructions, and producing a daily medication schedule for patients.

AHRQ Business Goals

- **Knowledge Creation:** Projects that: 1) collect data on and produce measures of the quality, safety, effectiveness, and efficiency of American health care and health care systems or 2) foster the development of knowledge about improving health care, health care systems, and capacity (e.g., training, placement).

The [*Improving Patient Access and Patient-Clinician Continuity Through Panel Redesign*](#) project, led by Dr. Hari Balasubramanian (Grant Number R03 HS 018795), demonstrates an example of the knowledge creation business goal. Using patient appointment data, physician panel sizes, and case mix from primary care databases, the project is studying how group practices can dynamically manage physician panels to improve timeliness of access and continuity. The project team will develop a quantitative decision support system to assist clinicians and practice managers.

- **Synthesis and Dissemination:** Projects that: 1) create tools and synthesis of evidence including knowledge, measure, and data or 2) disseminate information to multiple stakeholders to improve the system.

The [*Enabling Medication Management Through Utilization of Health Information Technology*](#) project, led by Dr. Ann McKibbin (Contract Number 290-07-100601-5), is a case example of the synthesis and dissemination business goal. An evidence report was developed regarding the impact of health IT on all phases of the medication management process, including prescribing and ordering; order communication, dispensing, administration, and monitoring; as well as education and reconciliation. The report identified gaps in the literature and provided recommendations for future research. Quality and safety considerations included: 1) accurate and timely prescribing of medication in response to a specific patient, 2) correct first-fill and refill dispensing of medications, 3) appropriate administering of medication, and 4) patients taking the pharmaceutical treatment regimen as prescribed.

- **Implementation and Use:** Projects that

partner with stakeholders to implement proven strategies for health care improvement, including empowering Americans to be proactive patients.

The [*Virtual Patient Advocate to Reduce Ambulatory Adverse Drug Events*](#) project, (Grant Number R18 HS 017196), led by Dr. Brian Jack, illustrates the implementation and use business goal. This project developed the Virtual Patient Advocate (VPA), a computerized, animated character that emulates the face-to-face conversational behavior of an empathic provider in providing health education, advice on monitoring and self-care, and assessment of medication dosing and adherence. Following hospital discharge, patients have access to the VPA via a Web portal, and are encouraged to use it before their first visit with their primary care physician. The randomized controlled trial began in August 2010 to test the concept of the VPA.

D. Funding Mechanisms

There are a variety of mechanisms for funding projects that further the goals of the Health IT Portfolio. Each award mechanism specifies the content, format, and timeline for deliverables, including periodic reporting requirements for completion of milestones and budget updates. Grants, cooperative agreements, contracts, and interagency agreements are four of the common mechanisms that AHRQ applies to carry out a wide variety of directed health services research and administrative activities. Description of each is provided below.

Grants and Cooperative Agreements¹

Grants provide money, property, or other direct assistance to allow eligible entities to carry

1. As described in the [HHS Grants Policy Statement](#).

out an approved project or activity in support of a public purpose that does not directly benefit the Government, with no substantial programmatic involvement with the recipient during performance of the financially assisted activities. Cooperative agreements are used when there will be substantial Federal programmatic involvement, meaning that program staff will collaborate or participate in project or program activities as specified in the Notice of Grant Award. For the purpose of this report, the term “grant” is used to include both grants and cooperative agreements.

Proposals for grants and cooperative agreements are submitted in response to AHRQ’s issuance of a funding opportunity announcement (FOA). One-time FOAs are known as request for applications (RFAs), and recurring FOAs are known as program announcements (PAs). There have been three major funding waves that have focused on health IT: 1) Transforming Health Care Quality through Information Technology RFAs, 2) Ambulatory Safety and Quality RFAs, and most recently 3) Health IT-Oriented Program Announcements². All of the grants in the first two categories had been awarded through now-closed, one-time RFAs. The funding initiatives are outlined below and described in more detail in Appendix A.

- **Transforming Health Care Quality through Information Technology (THQIT) RFAs.** The THQIT projects, awarded in 2004 and 2005, supported different aspects of organizational and community-wide health IT implementation-related activities, elucidated various stakeholders’ perspectives, and/or demonstrated the value of health IT implementation and use, particularly in rural hospitals and community-based health care settings. All of the grants awarded through the THQIT RFAs are now closed.



- **Ambulatory Safety and Quality (ASQ) RFAs.** The ASQ initiative awarded grants in 2007 and 2008 to support projects that focused on patient-centered care, quality measurement, and clinical management of complex patients. The ASQ initiative funded grants through the following four RFAs:
 - ***Enabling Patient-Centered Care (PCC) Through Health IT RFA (HS-07-007):*** Designed to investigate novel methods or evaluate existing strategies for using health IT to create or enhance patient-centered models of care in the ambulatory setting.
 - ***Improving Quality Through Clinician Use of Health IT (IQHIT) RFA (HS-07-006):*** Designed to investigate novel methods or evaluate existing strategies for clinician use of health IT in ambulatory settings to improve outcomes through more effective CDS, medication management, or care delivery.
 - ***Enabling Quality Measurement (EQM) Through Health IT RFA (HS-07-002):*** Intended to develop safety and quality measures in ambulatory care settings, automate quality measurement, demonstrate the ability of electronic data systems, expand potential safety and quality measures, and demonstrate improved ability to export data for reporting performance on measures and improvement.

2. Researchers interested in AHRQ funding opportunities should periodically check the [AHRQ Web site](#) for updates, and the [NIH grant notice page](#) for the most recent information on the peer review process, funding criteria, and application forms.

In April 2011, AHRQ published two new health IT-related FOAs to supplement its existing FOAs and special emphasis notice (SEN). These funding opportunities are designed to fund basic health IT research and fill gaps in the field that will lead to improved design of health IT systems.

- The [*Understanding Clinical Information Needs and Health Care Decision Making Processes in the Context of Health Information Technology \(IT\) \(R01\) FOA*](#) will fund research aimed at elucidating the nature of cognition, task distribution, and work in health care delivery settings. Research projects funded under this FOA will address current knowledge gaps regarding the understanding of health care providers' information needs and health care decisionmaking processes.
- The [*Understanding User Needs and Context to Inform Consumer Health Information Technology \(IT\) Design \(R01\) FOA*](#) will fund projects that will help build a knowledge base about consumers' personal health information management needs and practices and related design principles. Project results should lead to a better understanding of user needs and how their findings will impact consumer health IT design.
- ***Improving Management of Individuals with Complex Healthcare Needs through Health IT RFA (HS-08-002), also referred to as "Management of Complex Patients" (MCP)***: Serves to demonstrate the ability of health IT to assist clinicians, practices, systems, and patients and families in improving the quality and safety of care delivery for individuals with complex health care needs in ambulatory care settings, particularly in high-risk care transitions.
- **Health IT-Oriented PAs.** In September 2008, AHRQ issued three FOAs designed to help achieve measurable and sustained improvements in quality and safety of health care in ambulatory settings and in transitions of care through the development, implementation, and use of health IT. The funding opportunities (R03, R21, and R18) offer applicants incremental support for the conduct of increasingly complex health IT research projects. New proposals for the R03 and R21 FOAs are still being accepted by AHRQ, while the R18 FOA closed in May 2011. The first grants of these FOAs were awarded in September 2009. The following are general overviews about each of the FOAs.
 - ***Small Research Grants to Improve Healthcare Quality through Health IT (R03) (PAR-08-268)***: Supports different types of small research studies including: 1) pilot and feasibility or self-contained health IT research projects, 2) secondary data analysis of health IT research, and 3) economic prospective or retrospective analyses of health IT implementation.
 - ***Exploratory and Developmental Grant to Improve Health Care Quality through Health IT (R21) (PAR-08-269)***: Provides funding for health IT exploratory and developmental research projects that support the conduct of short-term preparatory, pilot, or feasibility studies. The R21 grants are intended to be more comprehensive and broader in scope than the relatively smaller, self-contained health IT research projects supported by the health IT R03 FOA.
 - ***Utilizing Health IT to Improve Health Care Quality Grant (R18) (PAR-08-270)***: Supports demonstration research grants that study health IT implementation and use to improve the quality, safety,

effectiveness, and efficiency of health care in ambulatory settings and transitions between care settings.

- **Other Health IT-Funded Grants.** The Health IT portfolio funds additional health IT-focused grants, including Career and Dissertation Awards (K01, K08, and R36), Conference Support Awards, Health Services Research (R01) Purpose Awards for ongoing extramural grants, Health Services Research Demonstration and Dissemination Grants (R18), and Centers for Education and Research on Therapeutics (CERTs).

Researchers interested in AHRQ health IT funding opportunities should periodically check the AHRQ Web site for updates:

http://healthit.ahrq.gov/portal/server.pt/community/funding_opportunities/655 as well as the most recent information on the peer review process, funding criteria, and application forms: <http://grants.nih.gov/grants/guide/notice-files/NOT-HS-10-002.html>.

Contracts

A contract is an agreement that is initiated by the Government to, under specified terms, acquire an identifiable product or service. The Health IT Portfolio uses various contract mechanisms to solicit requests for proposals (RFPs), including one-time RFPs and requests for task orders (RFTOs) when a master contract has been issued under an Indefinite Delivery Indefinite Quantity (IDIQ)³. Master contracts are a special type of RFP that are issued to a group of well-qualified contractors who are then eligible to compete for a subsequent series of master contract-issued RFTOs. RFTOs are provided to master

contract awardees for a particular program, such as the Primary Care Practice Based Research Networks.

1. National Resource Center (NRC) for Health IT Contracts.

There are numerous contracts that support the National Resource Center (NRC) for Health IT. AHRQ initially established NRC contracts in 2004 as a way to communicate and deliver technical assistance to its grantees. AHRQ's NRC supports the Agency's mission of developing and disseminating evidence and evidence-based tools on how health IT can improve health care quality, safety, and efficiency. The NRC is a resource for research findings, best practices, lessons learned, and funding opportunities for health IT researchers, implementers, and policymakers.

The NRC plays a pivotal role in supporting AHRQ's management of the Health IT Portfolio, including: generating and disseminating synthesized reference documents, such as lessons learned and project success stories; conducting a series of national Web conferences; and organizing and posting numerous resources on the NRC Web site. More than 10,000 documents, presentations, articles, and tools are freely available on the NRC Web site. Thirty-two master contractors currently support the diverse needs of the NRC across the following [four domains](#):

- [Domain 1](#) – Support for Health IT Program Management, Guidance, Assessment, and Planning
- [Domain 2](#) – Health IT Technical Assistance, Content Development, and Program-Related Projects and Studies
- [Domain 3](#) – Health IT Dissemination, Communication, and Marketing

3. For the full text of all AHRQ RFPs issued since 2000, see <http://archive.ahrq.gov/fund/contrarch.htm>.

- [Domain 4](#) – Health IT Portal Infrastructure Management and Web Site Design and Usability Support

2. Health IT Contracts.

In addition to the NRC, AHRQ funds a variety of knowledge-generating contracts through other mechanisms. The numbers of Health IT Portfolio contracts by contract mechanism are included in Appendix B.

Interagency Agreements

Interagency agreements (IAAs) are used to provide to, purchase from, or exchange goods or services with another Federal agency. In 2010, the Health IT Portfolio funded four projects that were managed by other Federal agencies. This report summarizes Health IT Portfolio-sponsored projects managed only by AHRQ.

III. Results and Discussion

Through the 180 projects that comprised AHRQ's Health IT Portfolio in 2010, the Agency is supporting the development and dissemination of evidence on how health IT can be used to improve the quality, safety, efficiency, and effectiveness of care in a variety of health care settings. This section presents the distribution of grants and contracts active in 2010 by Health IT Portfolio strategic goals, AHRQ business goals, and AHRQ lifetime funding. It also contains information on projects' spending, status of milestones, and the principal investigator's (PI's) history with Federal Grant funding, which is reported by grantees but not by contractors.



A. Health IT Portfolio Active Projects (Grants and Contracts)

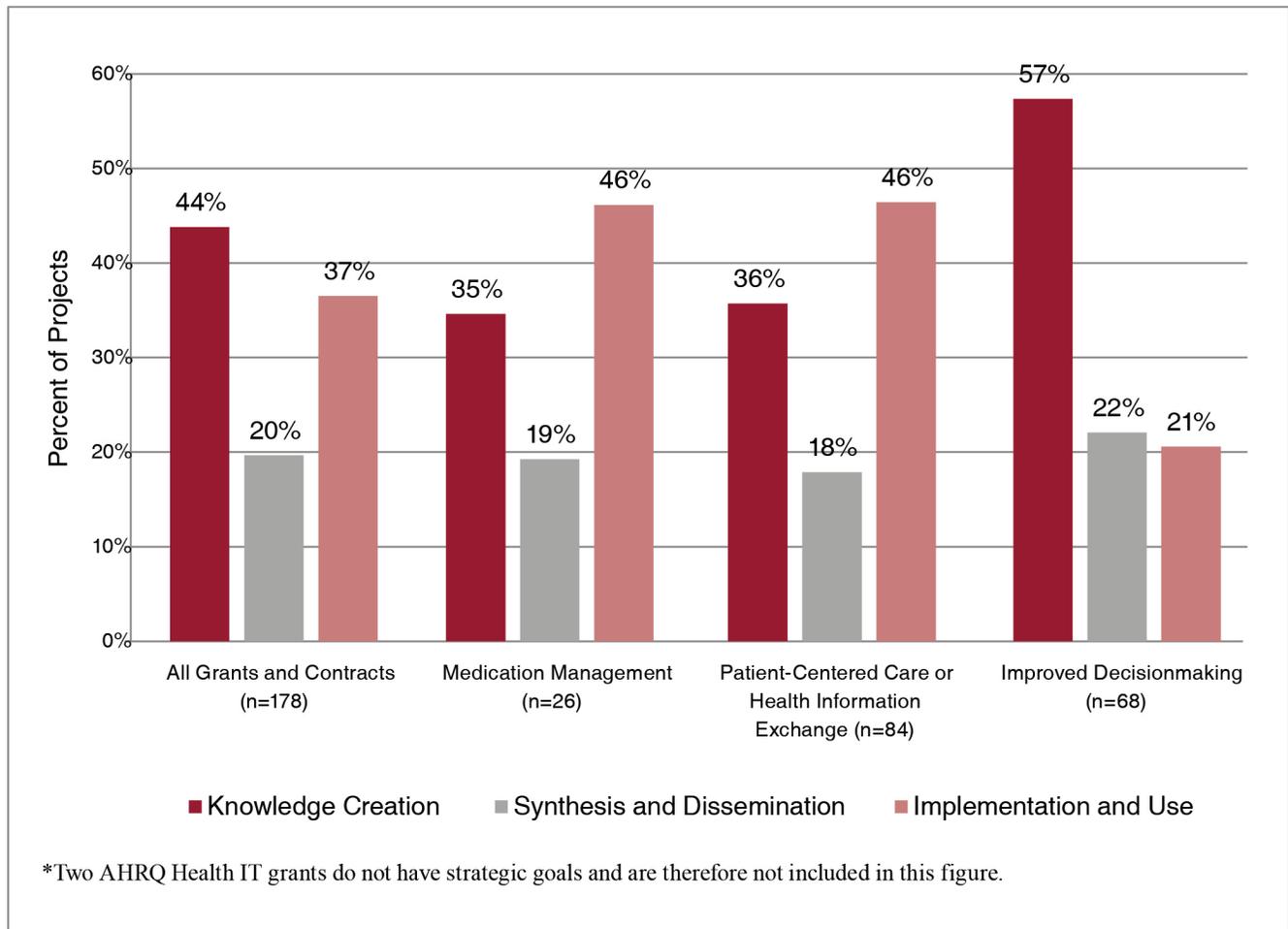
By Strategic and Business Goals⁴

Eighty-four projects (31 contracts and 53 grants), or 47 percent of all Health IT Portfolio-sponsored projects in 2010, were assigned the strategic goal of *enabling patient-centered care or health information exchange (PCC or HIE)* as shown in Figure 1. Sixty-eight projects (24 contracts and 44 grants), or 38 percent of the Portfolio's projects, had *improved decisionmaking* as their strategic goal. Twenty-six projects (4 contracts and 22

grants), or 15 percent, focused on *medication management* as their strategic goal.

The distribution of business goals differs by type of mechanism (grant or contract). Of the 121 grants, 54 (45 percent) focused on *implementation and use* of health IT. Fifty-four grants (45 percent) focused on *knowledge creation*. Thirteen grants, or 11 percent, focused on *synthesis and dissemination*. Among the 59 contracts, 24 (41 percent) focused on *synthesis and dissemination*, 24 contracts (41 percent) focused on *knowledge creation*, and 11 contracts (19 percent) focused on *implementation and use* of health IT.

Figure 1. AHRQ-Sponsored Health IT Grants and Contracts as of 2010, by Strategic and Business Goals*



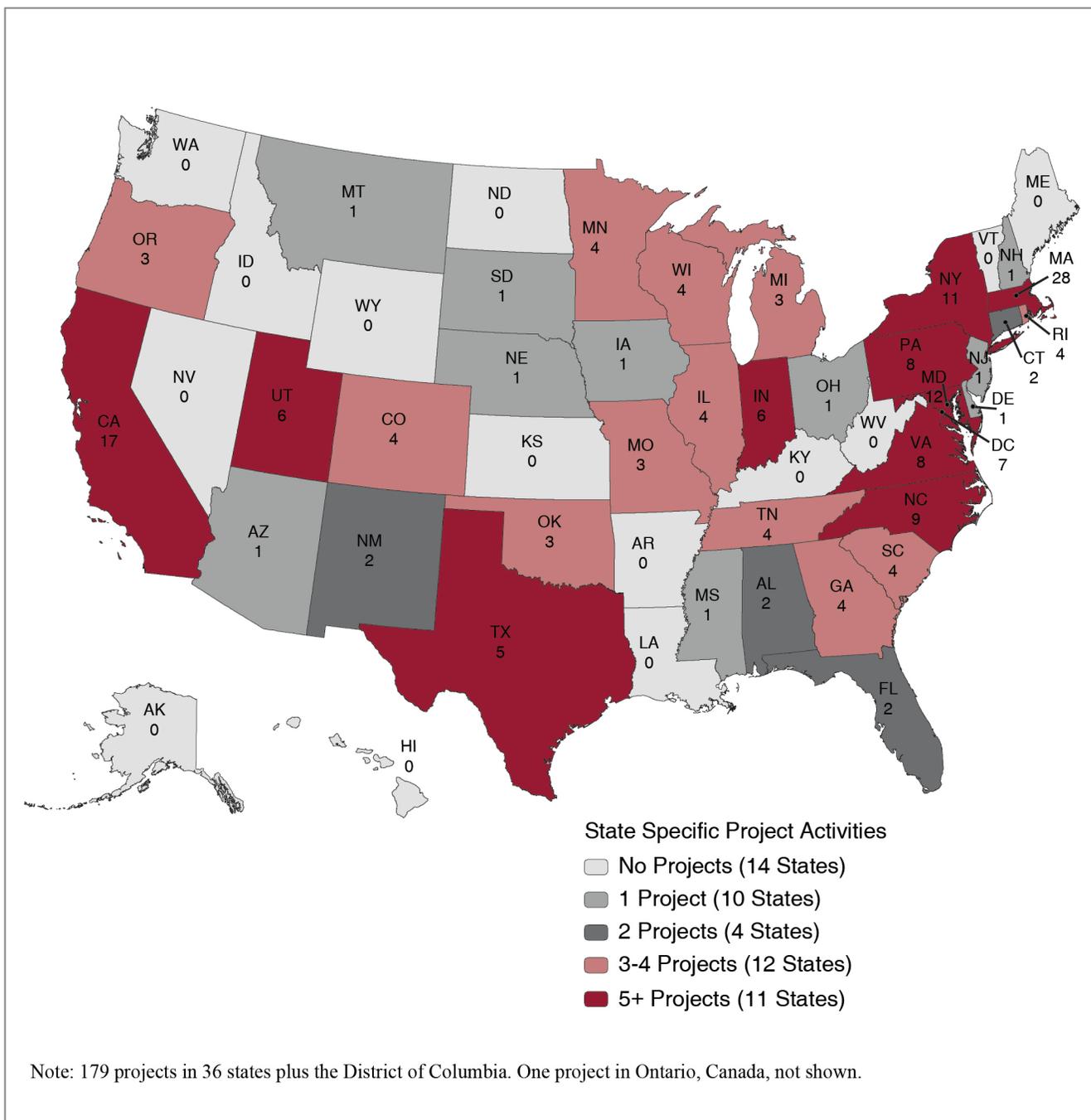
4. Two projects (grants) were not assigned a specific Health IT strategic goal.

Geographic Distribution of Active Projects

In 2010, the award recipient project institutions spanned 36 States and the District of Columbia (see Figure 2). One project was awarded to an institution in Ontario, Canada. Massachusetts, with 28, was the State with the highest number of active health IT projects. California, with 17, had the next-highest level of active health IT projects, followed by Maryland with 12, New York with 11, and North Carolina with 9.

with 28, was the State with the highest number of active health IT projects. California, with 17, had the next-highest level of active health IT projects, followed by Maryland with 12, New York with 11, and North Carolina with 9.

Figure 2. Number of Active Projects Sponsored by AHRQ’s Health IT Portfolio as of 2010 (by State)



B. Grant Terms and Counts

Term of Grants

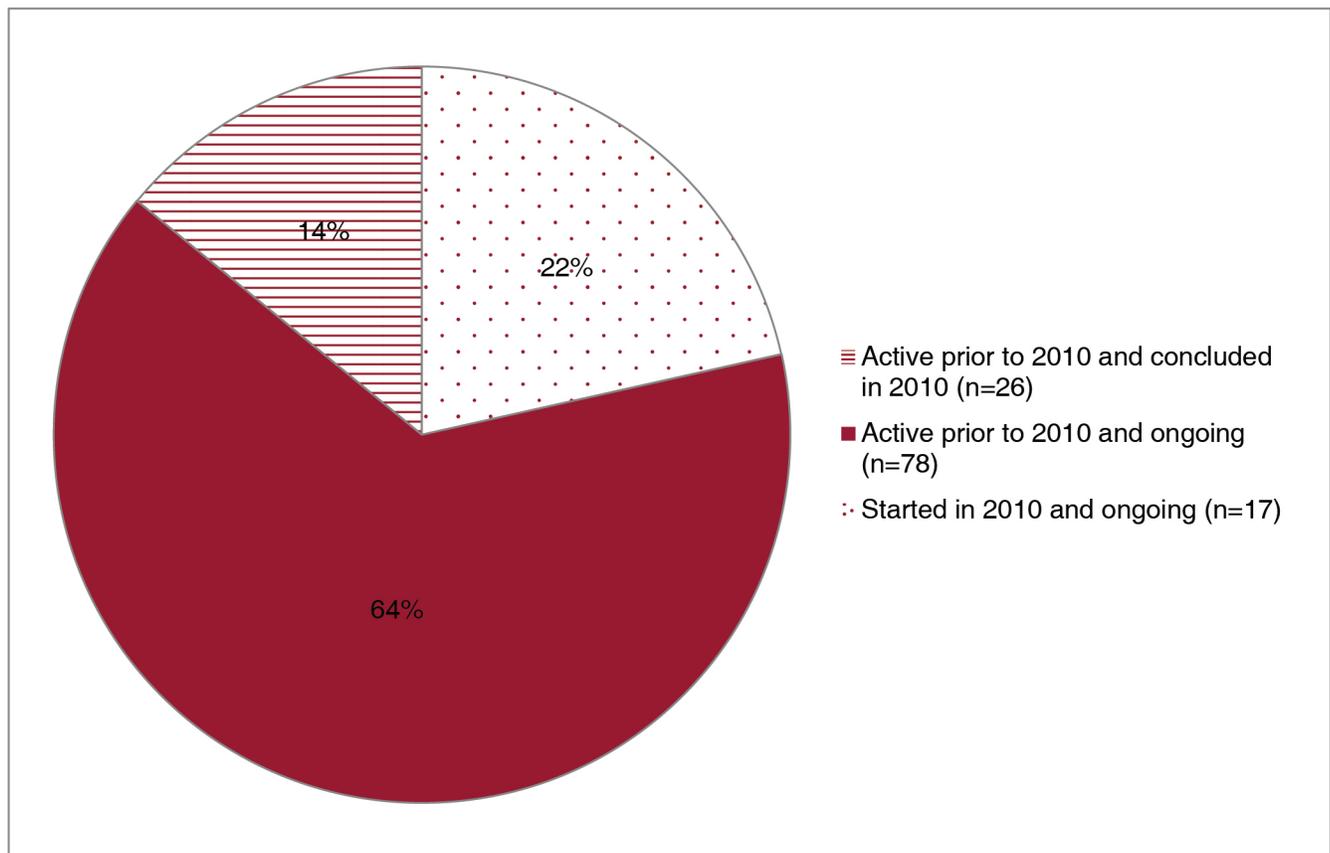
Maximum project periods for grants are specified in each FOA or PA. All of the Health IT Portfolio-sponsored grants active in 2010 were multi-year grants except for two smaller grants for conference support (R13), one R03 grant, and three Health Services Research Dissertation (R36) grants, which were all 1-year awards.

Grants that are issued under expanded authority⁵ are able to request a no-cost extension⁶. Requests can be made 1 month before the initial project end-date to extend the project period for

as long as 12 months, as long as there are no changes in scope. Grants, including cooperative agreements, that were not issued under expanded authority may request no-cost extensions of up to 12 months. The following list summarizes the number of projects that were operating under a no-cost extension at some point during 2010:

- The two THQIT grants active in 2010 were functioning under a no-cost extension. Both projects ended in January 2010.
- All 15 active EQM grants in 2010 received a no-cost extension; all but two of these grants ended in 2010.

Figure 3. Health IT Grants as of 2010, by Term of Grant



5. Operating authorities provided to grantees that waive the requirement for agency prior approval for specified actions.

6. An extension of the period of performance beyond the expiration date to allow the principal investigator to finish a project, with no additional cost to the government.

- Among the 24 active IQHIT grants, 18 received 12-month no-cost extensions and will end in 2011. One project received a 3-month no-cost extension and ended in late 2010.
- All but one of the 16 PCC grants received a no-cost extension: 13 projects for 12 months, one project for 6 months, and one project for 3 months.
- Two of the R03 grants were awarded no-cost extensions; one for 12 months, one for 3 months.

Figure 3 shows the status of grants in terms of how many projects that began prior to 2010 concluded or remained ongoing at the year's end, as well as how many new grants began in 2010. As demonstrated in Figure 3, the majority of the grants (78 projects, or 64 percent), were ongoing through the entire year, 17 grants (14 percent) began, and 26 grants (22 percent) ended.

Grants: Lifetime AHRQ Funding by Term of Grant and Strategic and Business Goals

Lifetime AHRQ funding refers to the total support (direct plus indirect costs) that AHRQ obligates to a grant during the project period, as long as the grantee's performance indicates continuation of the grant.

Among the 119 grants assigned a strategic goal and active in 2010, total AHRQ funding equaled \$103.4 million. Of these grants, 53 represented the most-commonly assigned strategic goal, *enabling PCC or HIE*, and represent \$48.0 million in lifetime AHRQ funding (see Table 1). This is not surprising considering that two FOAs (HS-08-002 and HS-07-007) funded projects to support health IT implementation and use for patients with complex medical needs and to support PCC. Twenty-two grants were assigned the goal of *medication management*, totaling \$21.4 million in lifetime AHRQ funding, and

Table 1. Counts and Lifetime AHRQ Funding for Active Health IT Grants as of 2010, by Term of Grant and Strategic Goals*

Grant Term	Medication Management		Patient-Centered Care or Health Information Exchange		Improved Decisionmaking		Total	
	Number of Projects	AHRQ Funding**	Number of Projects	AHRQ Funding**	Number of Projects	AHRQ Funding**	Number of Projects	Total AHRQ Funding** (%)
Active prior to 2010; concluded in 2010	3	\$3.6	7	\$5.5	15	\$11.0	25 (21%)	\$20.1 (19%)
Active prior to 2010; ongoing	17	\$17.4	39	\$40.2	21	\$20.7	77 (65%)	\$78.3 (76%)
Began in 2010; ongoing	2	\$0.5	7	\$2.3	8	\$2.2	17 (14%)	\$5.0 (5%)
Total	22 (18%)	\$21.4 (21%)	53 (45%)	\$48.0 (46%)	44 (37%)	\$34.0 (33%)	119 (100%)	\$103.4 (100%)

*The two AHRQ Health IT grants without strategic goals are not included in this table.

**In millions of dollars. Due to rounding, total AHRQ funding values may not equal the sum of their respective columns or rows.

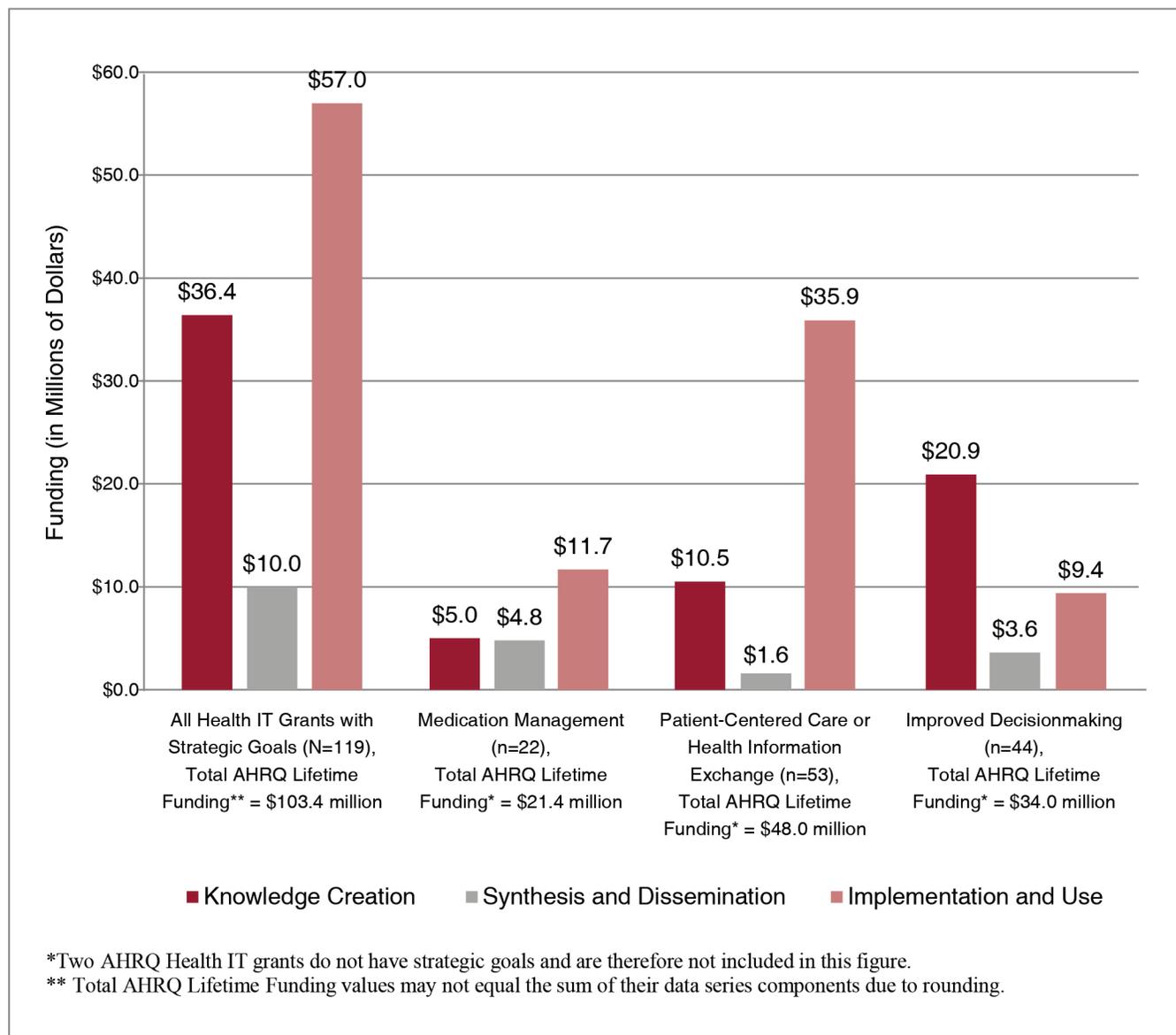
the 44 grants with *improved decisionmaking* as the goal accounted for \$34.0 million in lifetime AHRQ funding.

The distribution of AHRQ lifetime funding by business and strategic goals is shown in Figure 4. Grants that focused on the business goals of *implementation and use* of health IT and *knowledge creation* dominated the portfolio in terms of number of grants, each representing 45 percent of the portfolio, with 54 grants assigned

to each. However, total lifetime funding for grants assigned the *implementation and use* of health IT goal is, at \$57 million, higher than funding for *knowledge creation* grants, at \$36.4 million. *Knowledge creation* remains a growing focus of the Health IT Portfolio and continues to receive increased grant funding.

While only 9 percent (11/119) of grants have the business goal of *dissemination and synthesis*, totaling \$10.0 million, this number does not

Figure 4. AHRQ Lifetime Funding for Health IT Grants as of 2010, by Business and Strategic Goals*

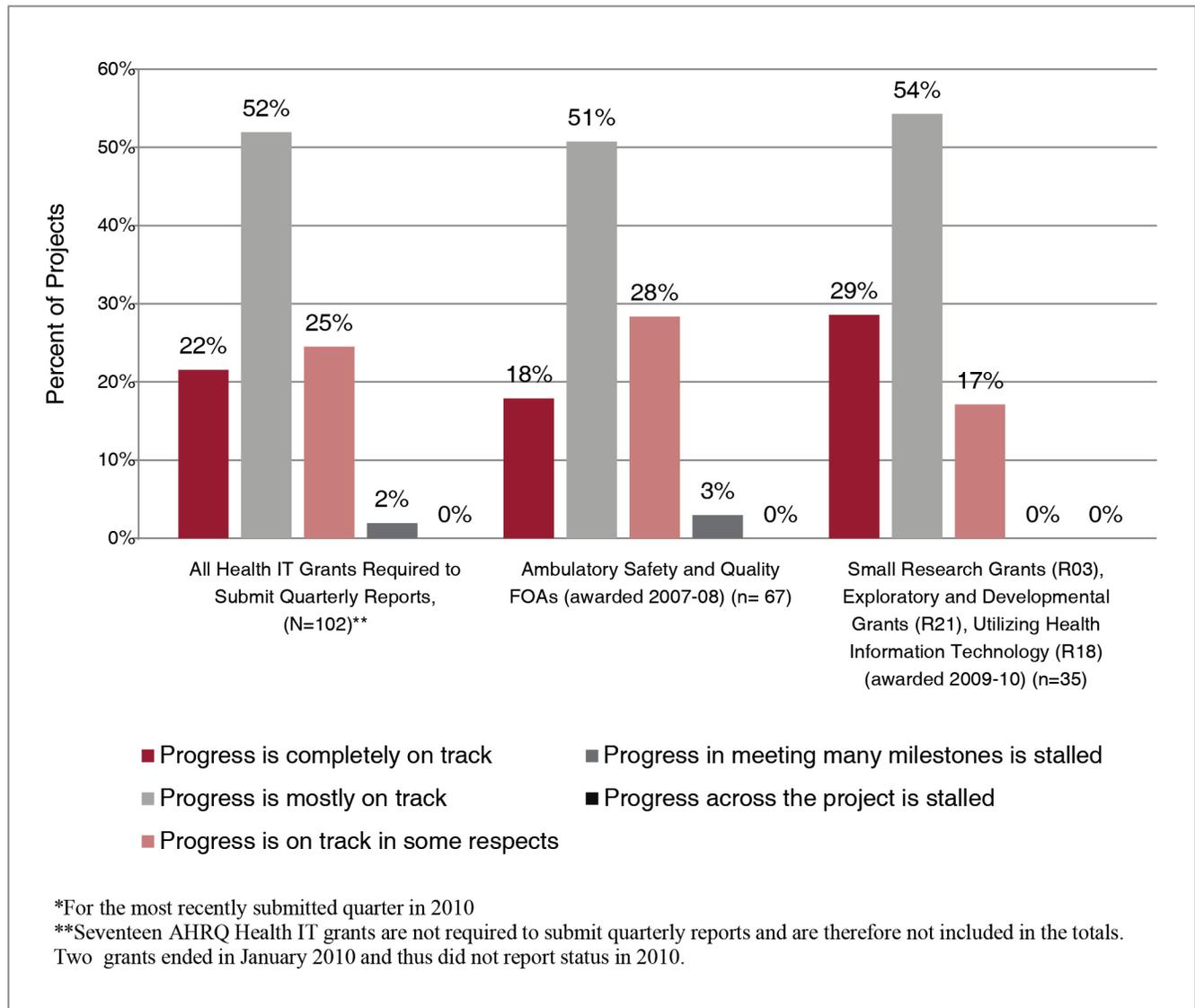


indicate an undervaluing of dissemination or synthesis activities. On the contrary, dissemination of results is a requirement specified in each FOA and notice of grant award. Each grantee is encouraged to update the NRC on a quarterly basis on the status of the grant, to post materials on the NRC Web site, to notify AHRQ's OCKT when and where manuscripts are to be published, and to participate in the annual AHRQ-sponsored meeting.

Grantees' Most Recent Self-Reported Project and Spending Status

In an effort to understand grantees' experience and performance in reaching their specific project milestones, most AHRQ Health IT Portfolio grantees report their project progress and challenges to AHRQ's Research Reporting System (ARRS) on a quarterly basis. AHRQ is monitoring the milestone progress and spending patterns of grantees both within and across

Figure 5. AHRQ-Sponsored Health IT Grantees' Self-Reported* Status Regarding Overall Goals as of 2010, by Funding Opportunity Announcement



funding mechanisms in order to understand factors that influence project process and spending. The ARRS reporting requirements include self-reported categorical variables for grantees to indicate the extent to which they are on track in reaching overall milestones and spending plans. Since these self-characterizations are reported quarterly, variation may occur from quarter to quarter for a given project. AHRQ recognizes that through the course of the grant process unexpected delays—such as loss of key personnel; additional time to ensure the institutional review board’s (IRB’s) approval of plans for protection of human subjects; or delays in software development, installation, or interfacing with pre-existing software—may temporarily delay achievement of research milestones and upend spending plans. Training (K-awards and research dissertation grants [R-36]) and other Health IT grants (e.g., conference support grants) do not report progress on a quarterly basis and are therefore not included in the totals.

The breakdown of AHRQ-sponsored health IT grantees’ last self-reported overall goal status⁷ in 2010 (see Figure 5) is:

- 22 percent (22/102) reported progress as ‘completely on track.’
- 52 percent (53/102) reported progress as ‘mostly on track.’
- 25 percent (25/102) reported progress as ‘on track in some respects but not others.’
- 2 percent (2/102) reported progress as ‘meeting many milestones is stalled.’
- 0 percent (0/102) reported progress as ‘stalled across project.’

In general, grantees report a high level of attaining grant-specified milestones with approximately 75 percent of grantees reporting

project progress as ‘mostly on track’ or ‘completely on track. During quarterly calls with John Snow, Inc, through an NRC task order contract focusing on monitoring and reporting on Health IT Portfolio-funded projects, none of the grantees reported problems that might lead to complete project failure. All grantees with reported delays in achieving specific milestones identified alternative solutions to overcoming challenges or anticipated that they would request a no-cost extension to complete the project.

The breakdown of AHRQ-sponsored health IT grantees’ last self-reported budget in 2010 (see Figure 6)⁸ is:

- 9 percent (9/102) were ‘significantly underspent,’ by more than 20 percent.
- 29 percent (30/102) were ‘somewhat underspent,’ by approximately 5 to 20 percent.
- 61 percent (62/102) were ‘spending roughly on target’.
- 1 percent (1/102) were ‘somewhat overspent,’ by approximately 5 to 20 percent.
- 0 percent (0/102) were ‘significantly overspent,’ by more than 20 percent.

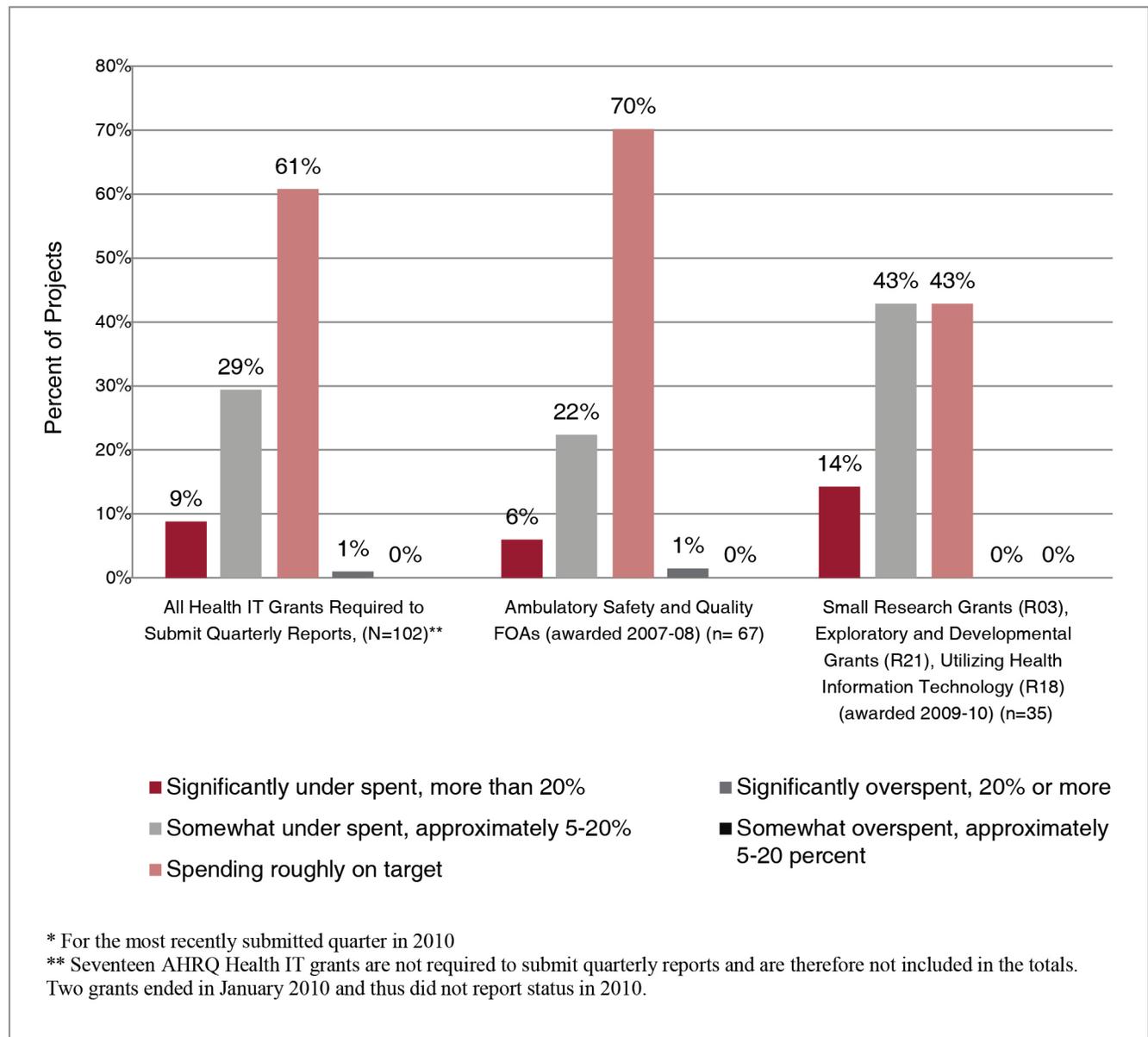
More than 60 percent of grantees reported their spending as on target in their most recent 2010 quarterly report, while 38 percent underspent budgeted AHRQ funds. Several of these grantees reported that underspending was a result of delays in implementation of the project (e.g., hiring staff, awaiting IRB approval), or technology development. Notably, grantees appear to be sound fiscal managers of their grant funding, as evidenced by the lack of reports of significant overspending.

Reporting these spending levels through ARRS is voluntary. However, if grantees are to receive approval for continuation of funding for each

7. Two grants ended in January 2010 and thus did not report status in 2010.

8. Numbers may not add up due to rounding.

Figure 6. AHRQ-Sponsored Health IT Grantees' Self-Reported* Spending as of 2010, by Funding Opportunity Announcement



multi-year grant, they are required to report budgeting and spending patterns annually in the requisite Public Health Service Form 2590.

C. Challenges Across Projects

Many of the health IT grants experienced various challenges. Three challenges, in particular, that consistently ranked high during each quarter of 2010 related to: 1) key personnel (n=37), 2)

sample or subjects (n=45), or 3) technology (n=33) (not listed in order of significance). While the categorization of challenges often fell into one of these three groups, the specific scenarios behind each of these challenges were as diverse as the grantees themselves. Below are some examples of challenges that were reported, followed by a discussion on how AHRQ-sponsored technical assistance (TA) was provided to help to overcome them.

Examples of Challenges Reported in 2010

- Lack of available technological personnel needed to build and support a particular intervention, causing the study team to seek alternate solutions to provide the same functionality and deliverables so as not to compromise the integrity of the study protocol.
- Relatively low study participant recruitment rates due to the design of the intervention endpoint placing a high degree of burden on participants. The study team had to alter the intervention endpoint to make recruitment more feasible while upholding the ability to assess the intervention and the study outcomes.
- Lack of commercially-available solutions for tracking and reporting medication compliance, leaving the study team to rely on prescription claims data to infer when prescriptions are filled or picked up. However, prescription claims data are not consistently and readily available. The project was challenged to identify strategies for analyzing prescription claims data and adjusting the study data accordingly if data erosion was evident.

D. Technical Assistance

AHRQ provides TA to health IT grantees to help them achieve their research and grant objectives and disseminate their findings to advance the field. AHRQ's TA program develops and provides a wide range of resources and tools to help grantees complete projects on time and expedite dissemination of findings that may transform clinical practice.

AHRQ funds TA through Booz Allen Hamilton (BAH), one of the NRC contractors, to respond to challenges facing grantees, particularly issues that may slow a project's progress. TA is

provided as grantee-specific, one-on-one TA, or multi-grantee TA. Below are examples of TA categories and types requested in 2010.

Grantee-Specific TA

The purpose of one-on-one grantee-specific TA is to ensure the progress and on-time completion of health IT-funded grant projects. Specifically, grantee-specific TA fosters the timely delivery of discrete assistance so that individual grantees' challenges and barriers to the conduct of health IT research are addressed. TA can be requested by a PI, another project team member, or by AHRQ staff on the project's behalf. The TA provider contacts the project team to gather followup information and determine whether their request is in scope for TA. In 2010, there were two requests that were out of scope; the remaining 33 TA requests in 2010 were considered in scope. The frequency, request type, and an example for each are listed in Table 2.

Multi-Grantee TA

Multi-grantee TA leverages open-forum meetings and peer-to-peer teleconferences to allow grantees to compare experiences and address common challenges, mitigating approaches, proven successful research methods, and other pertinent considerations. Multi-grantee TA meetings are held via Webinar teleconferences or in-person meetings. These meetings often include outside experts who provide insight on a specific topic. The peer-to-peer teleconferences allow grantees with similar projects to share their experiences without formal presentations (see Table 3).

Other Multi-Grantee TA Formats

Since August 2010, the AHRQ Health IT TA Listserv has served as an opt-in discussion platform where grantees can collaborate, share information, and form virtual topical

Table 2. 2010 One-on-One Technical Assistance Activities*

2010 TA Requests	TA Category	Example
11	<u>Technology</u> <ul style="list-style-type: none"> IT infrastructure Delays in systems implementation Workflow 	Request dialogue with other grantees concerning EHR and HIE implementation in the behavioral health setting, specifically involving privacy and security issues and information exchange among providers.
8	<u>Methodology</u> <ul style="list-style-type: none"> Measurement, metrics, analytics 	Request for assistance in identifying survey instruments that could be used as a reference or modified to help develop utilization and provider satisfaction questionnaires. The objective is to survey providers before and after use of system to ascertain how helpful the system was.
4	<u>Recruitment</u> <ul style="list-style-type: none"> Patient recruitment and retention Recruitment of priority populations 	Request for information regarding best practices and effective ways of providing remuneration for physicians participating in a surveys.
3	<u>Privacy/Security/Protection of Human Subjects</u> <ul style="list-style-type: none"> Data privacy concerns Data security issues IRB issues 	Request for information regarding social networking sites (e.g., Facebook) and issues of consent, how to write the consent process, and how to approach the IRB process.
2	<u>Grants Administration</u> <ul style="list-style-type: none"> Reporting Personnel issues, e.g., turnover Substantive administrative issues Institutional support Scope 	Request for review of first ARRS quarterly report.
2	<u>Other</u> <ul style="list-style-type: none"> Requests that do not clearly fall under one of the other eight established categories 	Request for a list of U.S. Preventive Services Task Force (USPSTF) recommendations by grade (e.g., A, B, C, D, I), rather than by disease or topic. The grantee needed the recommendations to weigh the evidence versus the impact and feasibility of service delivery, cost effectiveness, and risk/benefit ratio, in order to map those back to their own measures.
2	<u>Analysis Protocols</u> <ul style="list-style-type: none"> Data quality issues and reporting lags Data acquisition issues Evaluation Surveys Data collection issues 	Request for assistance with identifying the analysis plan and SAS program for the October 6, 2008, version of the Consumer Assessment of Healthcare Providers and Systems (CAHPS) Survey. The grant project team initiated the survey in July of 2009 and used this version of CAHPS. The instructions and analysis program, available on the AHRQ Web site, is from the newest version, October 8, 2009, and was therefore not applicable to the version that the team used.
1	<u>Dissemination</u> <ul style="list-style-type: none"> Sharing information v. exclusivity of findings Strategies for submitting manuscripts and choosing the publication outlets Preparing reports and manuscripts Message development for media and the general public Scope issues 	Request for general support with dissemination process.

*Other categories of available TA include engagement and quality. Because there were no requests for these categories in 2010, they are not listed in the table.

Table 3. 2010 Multi-Grantee Specific Technical Assistance Activities

Multi-Grantee TA Category	2010 Topics and Links to Materials
Web-Based Meeting	Multi-Grantee Technical Assistance Meeting: Successful Dissemination Strategies: A Practical Approach to Effective Dissemination of Research Findings Multi-Grantee Technical Assistance Meeting: Institutional Review Boards: Challenges and Best Practices Multi-Grantee Technical Assistance Meeting: Patient Recruitment - Challenges, Trends, and Best Practices Multi-Grantee Technical Assistance Meeting: Provider Engagement - Recruitment, Engagement and Retention Ambulatory Safety and Quality (ASQ) Grants: Closeout Requirements and Final Reports (2 sessions)
Peer-to-Peer Teleconference	Medication Reconciliation Personal Health Records (PHR)
In-Person Meeting	AHRQ Annual Health IT Grantee and Contractor Meeting

communities. In addition to the listserv, AHRQ created an FAQ document that addresses grants management and administration topics and is a resource for TA providers when working with grantees on administrative-related issues.

E. Grantee Lifetime Funding and Outputs

Principal Investigators

Grants and cooperative agreements are awarded to an institution rather than to a specific PI. However, the PI is the designee within the recipient organization and is responsible for the scientific, technical, and programmatic aspects, and day-to-day management of the project. Among the 121 health IT grants active in 2010, there were 113 distinct PIs. Eight PIs had two AHRQ-sponsored health IT grants active in 2010. Information about PI grantee award histories is based on data from the Information for Management Planning, Analysis, and Coordination (IMPAC) II database. This grantee award database is maintained by the National Institutes of Health (NIH) and is used by

agencies within the Department of Health and Human Services.



Previous Career or Training Grant: Among the 113 unique PIs who had an active health IT-sponsored grant in 2010, 30 (27 percent) were recipients of a previously-funded career award (K-award) or training grant (T-32) to enhance their research abilities. These previous grants were funded by a range of Federal agencies including HRSA, AHRQ, the Centers for Disease Control and Prevention (CDC), and NIH. Among these 30 PIs, 15 had received one or more K-awards, 13 had received a T-32 training grant, and two PIs had received both a K-award and a

Table 4. Distribution of First-Time Grant Principal Investigators, by Funding Opportunity Announcement

Percentage of First-Time PIs	Transforming Healthcare Quality Through Health IT (THQIT) FOAs
50% (1/2)	RFA-HS-05-013 Limited Competition for AHRQ THQIT Implementation
Percentage of First-Time PIs	Ambulatory Safety and Quality (ASQ) FOAs
44% (7/16)	RFA-HS-07-007 ASQ Enabling Patient-Centered Care Through Health IT
25% (6/24)	RFA-HS-07-006 ASQ Improving Quality Through Clinician Use of Health IT
20% (3/15)	RFA-HS-07-002 ASQ Enabling Quality Measure Through Health IT
8% (1/12)	RFA-HS-08-002 ASQ Improving Management of Individuals with Complex Healthcare Needs through Health IT
Percentage of First-Time PIs	Health IT-Oriented PAs
57% (4/7)	PAR-HS-08-268 Small Research Grant to Improve Health Care Quality Through Health IT (R03)
19% (3/16)	PAR-HS-08-270 Utilizing Health IT to Improve Health Care Quality (R18)
67% (8/12)	PAR-HS-08-269 Exploratory and Developmental Grant to Improve Health Care Quality through Health IT (R21)
Percentage of First-Time PIs	Training and Career
58% (7/12)	NOT-HS-08-014 Special Emphasis Notice: Career Development (K01, K02, K08) and Dissertation (R36) Grants Focused on Health Information Technology (IT)
Percentage of First-Time PIs	Conference Support and Other FOAs
50% (1/2)	PAR-09-231 Small Grant Program for Conference Support (R13)
0% (0/1)	RFA-HS-07-004 Centers for Education and Research on Therapeutics (CERTs) (U18)
100% (1/1)	PAR-09-257 AHRQ Grant Program for Large Conference Support (R13) and (U13)
0% (0/1)	PAR-09-070 AHRQ Health Services Research (R01)

T-32 training grant. In addition to the work they are conducting on their career or training grants, many of the K-award and training grantees are mentored by more experienced investigators and may also collaborate on another AHRQ-funded research grant. For example, Dr. Guilherme Del Fiol, an active K-award grantee who leads the project *Context-Aware Knowledge Delivery into Electronic Health Records*, is also a team member of the IQHIT project *Improving Quality through Decision Support for Evidence-Based Pharmacotherapy*.

Previous Federal Grant: The percentage of first-time grantees across the ASQ FOAs varied. One out of the 12 PIs (8 percent) awarded an Improving Management of Individuals with Complex Healthcare Needs through Health IT grant was a first-time PI. Among the other three ASQ FOAs, three PIs (20 percent) leading Enabling Quality Measure through Health IT grants were first-time PIs, six first-time PIs

(25 percent) were awarded Improving Quality through Clinician Use of Health IT grants, and seven first-time PIs (44 percent) were awarded Enabling Patient-Centered Care through Health IT grants.

Eight of the 12 PIs (67 percent) who had an Exploratory and Developmental Grant to Improve Health Care Quality through Health Information Technology (R21) grant were new PIs. Three (19 percent) of the 16 PIs who had Utilizing Health Information Technology to Improve Health Care Quality (R18) grants were new. Four (57 percent) of the seven PIs who had a Small Research Grant to Improve Health Care Quality Through Health Information Technology (R03) were new PIs. See Table 4 for more detail.

Outputs

Grantees submit information about tools, products, and other outputs, such as publications

Table 5. Tools, Products, and Other Outputs from 2010

Type of Tool/Output	Count
Presentation	82
Poster	60
Publication (peer reviewed)	27
Other	23
Internal Documents	20
Tool	15
Publication (non-peer reviewed)	13
Surveys	12
Data Collection Tools	11
Manuscript	8*
Tool/Product	4
Measures/Specifications	3
Product	2
Total	280

*Including manuscripts submitted, but not yet accepted for publication.

or presentations, related to or developed from their projects. During 2010, grantees reported a total of 280 outputs, the majority of which (82) were presentations. Grantee outputs are categorized in Table 5.

The outputs categorized as “other” included news articles, abstracts submitted for conferences, and outputs such as a Web-based video demonstrating a recent version of a system interface.

F. Contracts

In 2010, the Health IT Portfolio had 59 active contracts with cumulative AHRQ lifetime funding of \$71.8 million. These contracts enabled individual projects to address a defined, pre-determined need. Each contract was assigned one of three Health IT Portfolio strategic goals and one of three AHRQ business goals.

Initial project duration is specified in each contract, and some contracts have a provision to

support additional option years. The start dates and duration of the 59 project-specific contracts active in 2010 vary from 1 year to more than 5 years.

As shown in Table 6, a greater number of contracts (n=31) and larger amount of contract funding (\$43.8 million) are associated with the Health IT Portfolio strategic goal of *PCC or HIE* than the other two strategic goal categories combined (n=28 and \$28.0 million). This is in part because the six SRDs for HIE contracts, which collectively have an AHRQ lifetime budget of \$31.4 million, and are assigned the strategic goal of *PCC or HIE*. There were 24 contracts with a Health IT Portfolio strategic aim of *improved decisionmaking*, and a total of \$25.8 million funding. Health IT Portfolio support for *medication management* is lower than other categories, at \$2.2 million for four contracts.

For business goals, equal numbers of contracts had a business goal of *synthesis and*

Table 6. Counts and Lifetime AHRQ Funding for Health IT Contracts as of 2010, by Health IT Portfolio Strategic Goal and AHRQ Business Goal

AHRQ Business Goal	Medication Management		Patient-Centered Care or Health Information Exchange		Improved Decisionmaking		Total	
	Number of Projects (%)	AHRQ Funding* (%)	Number of Projects (%)	AHRQ Funding* (%)	Number of Projects (%)	AHRQ Funding* (%)	Number of Projects (%)	Total AHRQ Funding* (%)
Implementation and Use	1	\$1.0	6	\$31.4	4	\$2.6	11 (19%)	\$35.0 (49%)
Knowledge Creation	2	\$0.8	13	\$5.1	9	\$19.8	24 (41%)	\$25.7 (36%)
Synthesis and Dissemination	1	\$0.4	12	\$7.3	11	\$3.4	24 (41%)	\$11.1 (15%)
Total	4 (7%)	\$2.2 (3%)	31 (53%)	\$43.8 (61%)	24 (41%)	\$25.8 (36%)	59 (100%)	\$71.8 (100%)

*In millions of dollars. Due to rounding, total AHRQ funding values may not equal the sum of their respective columns or rows.

dissemination or knowledge creation (24 each, 41 percent), followed by *implementation and use* (n=11, 19 percent).

Both of the 2-year projects for the Clinical Decision Support (CDS) Initiative (funded at \$6.2 million and \$6.3 million) had an AHRQ business goal of *knowledge creation*. Excluding the larger contracts for SRD and CDS, AHRQ lifetime funding ranged from \$50,000 to \$4.7 million for the remaining 51 contracts.

G. Project Successes

As illustrated in this report, AHRQ funds various types of health IT projects. These projects address important gaps in the research and relevant literature about health IT implementation and use, particularly its impact on quality, safety, and improved health care outcomes, and the applicability of those findings to other health care settings. This section provides several examples of AHRQ-funded projects that were active in 2010 and demonstrate the range of the Health IT Portfolio's success.

Patients Take a Bite of Prevention Apple with Web-Based Interactive Personal Health Records:



Dr. Alex Krist is leading a series of AHRQ-funded projects, each building upon

the previous to show: 1) the development and effect of an interactive PHR (IPHR) tool on patient outcomes, 2) the ability of the tool to integrate with multiple and varied EHRs and health care settings, and 3) how the tool can be integrated into the workflow of all practices and be made available to all practice patients. The first study, *An Interactive Preventive Health Record (IPHR) to Promote Patient-Centered Care*, demonstrated

the tool's efficacy in improved outcomes in the delivery of preventive services. The followup studies, *Promoting Use of an Integrated Personal Health Record for Prevention* and *Using Health Information Technology to Improve Health Care Quality in Primary Care Practices and in Transitions between Care Settings*, are helping to demonstrate the tool's ability to be adopted and utilized in a range of primary care settings. This latter focus, which includes engaging providers in the redesign of their workflow and with patients in the management of their own care, will provide important insight into further and more widespread adoption.

Individualized, Multi-Media Materials in Spanish and English Help Seniors Manage Medications and Communicate with Clinician Teams:



In order to address challenges that older adults may have with adherence to their medication regimens, Dr. Kate Lapane and a group of researchers developed DVD segments on topics such as insomnia, depression, heart failure, and diabetes as part of the *Tailored DVD to Improve Medication Management for Low-Literate Elderly Patients*. In the process of developing the DVDs, researchers learned that older adults often take their medications in ways other than prescribed; are unaware of the danger of taking medications incorrectly; and assume that their

primary care provider knows about all of their medications, including those prescribed by other caregivers. Viewers found the DVDs to be informative and enjoyable, and the majority reported that the DVD content was highly relevant to their situations.

Time, Effort, and Infrastructure Costs to Use EHRs:

Dr. Neil Fleming's project, *Impact of Health Information Technology on Primary Care Workflow and Financial Measures*, sought to reduce the uncertainty about startup and maintenance costs of EHR implementation, as well as the impact of implementation on provider productivity. The project included an economic analysis to identify the costs of planning, implementing, and maintaining an ambulatory EHR for primary care practices. The study team found that implementing an EHR at a five-physician practice cost an estimated \$162,000, with \$85,500 in maintenance expenses during the first year. The team also found increased expenses and decreased productivity during the 6 months following EHR implementation. However, by 12 months after the EHR was in place, productivity was close to pre-EHR levels.

Toolkit Available for Assessing the Impact of Health IT on Workflow in Provider Offices:

Dr. Pascale Carayon's project, *Incorporating Health Information Technology Into Workflow Redesign*, gathered information related to workflow changes in a variety of health IT systems and care settings. The team addressed the negative technological impacts on quality and safety, which can result when health IT is not designed to fit the specific context of a given practice or a patient population. The study determined that all practices benefit from a clear understanding of how clinical and administrative tasks are performed, and how these processes might change with the introduction of health IT. Among practices that have implemented health

IT, some workflow effects, such as an initial increased workload for physicians, seem to be universal. Dr. Carayon and her team synthesized their own and existing research to develop a toolkit to help small- and medium-sized practices assess their workflow to gain a better understanding how health IT may impact it, and to minimize drawbacks in the process.

Pediatric Medication Prescribing Made Simpler and Safer:



As part of the *STEPStools: Developing Web Services for Safe Pediatric Dosing* grant, Dr. Kevin Johnson and his team developed a tool to help pediatricians prescribe the appropriate medication dose for children based on their age and development. STEPStools is improving the quality and safety of medications for children and includes recommendations for appropriate doses of 90 percent of the medicines most-commonly prescribed to children that require weight-based dosing. In addition to the immediate safety impact, there are several secondary benefits of correct dosing and helping kids get healthy faster, including fewer days home from school for children, and fewer days home from work for their caregiving parents. This Web-based tool is compatible with many electronic prescribing tools. The project team is working with the American Academy of Pediatrics to disseminate the tool.

Projects Pave Way for Health Information Exchange Efforts in the U.S:

Six State and regional HIE demonstration projects were conducted to identify and support data sharing and exchange activities aimed at improving health care for patients and populations. These States and their respective health information organizations (HIOs) were:

- Colorado: Colorado Regional Health Information Organization (CORHIO)
- Delaware: Delaware Health Information Network (DHIN)
- Indiana: Indiana Network for Patient Care (INPC)
- Rhode Island: currentcare
- Tennessee: Mid-South e-Health Alliance (MSeHA), project management team from Vanderbilt University Center for Better Health
- Utah: Utah Health Information Network (UHIN)

Over the course of these 5-year contracts, HIOs demonstrated different approaches to establishing HIE based on the needs of their community, care-delivery infrastructure, and laws within their individual States or regions. While the HIOs varied in their approaches, they nonetheless paved the way for other organizations. With few established HIOs in existence at the time, these six contracts provided an opportunity to study how these organizations are planned, implemented, and sustained. In the process of developing and implementing these diverse systems, these HIOs learned several key lessons about success and changed the HIE landscape.

- Each HIE is unique: there is no “one-size fits all.”
- A range of stakeholders must be engaged for HIE to be successful.

- Establishing a sound business plan is critical.
- Securing funding early in the planning process allows greater flexibility.
- Patient identification and matching is a core challenge in HIE.
- Technology development is influenced by policy and operational considerations.
- Architecture should be based on the needs of the community.
- Initial focus on clinical settings with high impact leads to early wins.

Lessons learned from the SRD contracts were disseminated in a report prepared by AFYA, Inc., [Lessons Learned from AHRQ’s State and Regional Demonstrations in Health Information Technology](#). More information on the SRDs is available on the [SRD Web site](#).

These projects are a sample of the diverse research that the Health IT Portfolio funds. They demonstrate the positive impact of health IT implementation and use on changes in quality, safety, and improved health care outcomes. [Individual success stories](#) for some of these projects have been developed and are available as featured projects on the NRC Web site.

IV. Dissemination

An important aspect of AHRQ's Health IT Portfolio is its mission to disseminate the information generated by its programs and partners. This section reflects the range of synthesis and dissemination activities by reviewing the presentation and outreach activities of Health IT Portfolio members and OCKT, as well as numerous NRC-sponsored activities.

There are five complementary means for the AHRQ-led dissemination of health IT information:

- Presentations by members of the Health IT Portfolio
- AHRQ's Annual Health IT Grantee and Contractor Meeting
- AHRQ's Annual Conference
- NRC for Health IT
- AHRQ's Office of Communications and Knowledge Transfer

A. Presentations by Members of the Health IT Portfolio



Members of the Health IT Portfolio made numerous presentations to various stakeholder groups and

venues, including: the Healthcare Information and Management Systems Society Annual Meeting in March 2010; AcademyHealth's Annual Research Meeting in June 2010; the National Regional Extension Centers and Health Information Exchange Summit West in

October 2010; and co-sponsored meetings with other Federal agencies including the Centers for Medicare & Medicaid Services, the Food and Drug Administration, the Office of the National Coordinator (ONC) for Health IT, and the Veterans Health Administration.

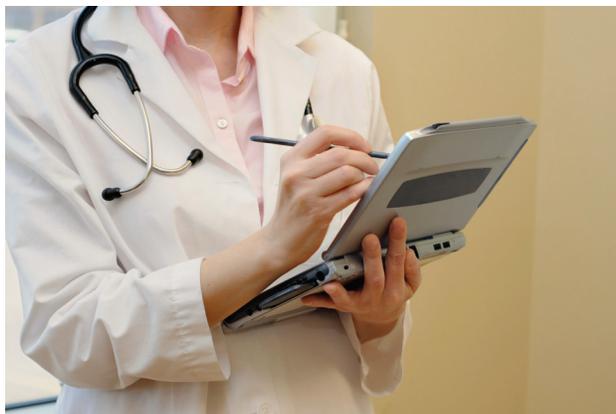
B. AHRQ's Annual Health IT Grantee and Contractor Meeting

AHRQ hosted the 2010 Annual Health IT Grantee and Contractor Meeting from June 2 to 4 in Washington, DC⁹. The meeting was an opportunity for AHRQ health IT project officers, grantees, and contractors to gather together to learn about the latest research in health IT, share lessons learned, and build on each other's work. This meeting was also an opportunity for grantees and contractors to share preliminary research findings and tools with each other. A total of 282 grantees, contractors, and other project staff attended this 3-day meeting.

The meeting agenda included a variety of plenary, panel, and keynote presentations. A sample of the presentations is summarized below:

- Dr. James Kahn's presentation, "A Randomized Study of the Personal Health Record in the Public Health Setting," emphasized that as PHRs become more common, there is increased opportunity to promote self-management as a means to improve health. The presentation outlined the randomized, controlled trial that Dr. Kahn and his team are conducting to evaluate clinical outcomes for PHR versus non-PHR users. Preliminary data indicate a range of computer skills among participants who were enthusiastic about seeing their personal health information in one place.

9. [AHRQ Annual 2010 Health IT Grantee and Contractor Meeting](#). Agency for Healthcare Research and Quality.



- Dr. Catherine M. DesRoches’s presentation, “Going it Alone? The Impact of Stand-alone versus EHR-Integrated E-prescribing Systems,” illustrated how her team responded to the paucity of empirical evidence available on the value of e-prescribing in the ambulatory setting. The project distributed an e-prescribing survey to 2,000 physicians enrolled with the 15 largest e-prescribing vendors in the United States. Survey responses indicated that the type of system was not associated with greater efficiency but is associated with increased prescribing safety.
- Dr. Eta Berner’s presentation, “Closing the Diagnostic Loop to Improve Diagnostic Quality,” summarized a project that is developing an automated system to help improve proactive patient followup after a diagnosis. Study outcomes included time-to-resolution of the problem, medication adherence, patient satisfaction, resource utilization, and physician feedback. Data indicated less severe problems with early followup, high self-reported medication adherence, and high overall patient satisfaction.

C. AHRQ’s Annual Conference

AHRQ hosted its fourth annual conference from September 27 to 29, 2010, in Bethesda, MD¹⁰. The conference, titled “Better Care, Better Health: Delivering on Quality for All Americans,” showcased leading authorities in health services research and policy.

The conference featured presentations in five major tracks:

1. Transforming Health Care Delivery
2. Developing New Patient Care Models
3. Strengthening Preventive Care and Reducing Health Disparities
4. Improving Quality and Patient Safety
5. Measuring and Reporting on Provider and System Performance

As part of the first track, Health IT team members reviewed the Health IT Portfolio’s accomplishments and activities of the past year and described activities for the coming year, including collaborations with other Federal programs. Other health IT-related presentations included information on how AHRQ supported the health IT Regional Extension Centers (RECs) by, in partnership with ONC, establishing the National HITRC to gather and share best practices with the RECs. AHRQ also delivered a presentation on the SRDs, that included lessons learned and ways that new and emerging HIE initiatives might leverage those lessons.

In addition, there were several presentations given by grantees and contractors, including the following:

- Dr. Joseph Finkelstein’s presentation, “Enabling Patient-Centered Care through Health IT: A Systematic Review of the Evidence,” synthesized the impact of health IT applications on facilitating the

10. [AHRQ 2010 Annual Conference](#). Agency for Healthcare Research and Quality.

provision of patient-centered care based on a literature review of 322 relevant articles. The review indicated that a positive effect has been demonstrated on the major types of outcomes. However, most studies did not use a comprehensive approach to developing health IT to support patient-centered care. In addition, high heterogeneity of outcomes limited comparative evaluation.

- Dr. Jerry Osheroff presented “Structuring Care Recommendations for Clinical Decision Support,” which described a project that sought to accelerate widespread uptake of well-accepted, evidence-based patient care recommendations into clinical information systems via CDS. The project included an assessment of stakeholders’ prior work and needs, conversion of guideline recommendations into structure logic statements, and dissemination of processes, lessons, and results. This project stimulated conversation among key CDS players, cultivated synergies between CDS and performance measurement, and illustrated the concept of formal logic structures to support CDS-enabled health care performance improvement.
- Dr. Lynne Nemeth delivered a presentation entitled “Increasing the Effective Use of Electronic Standing Orders.” Standing orders may improve efficiencies and increase preventive services when used with EHR reminder systems in primary care. In order to demonstrate this effect, a pilot demonstration project was conducted in eight primary care practices in eight States. Six of the eight practices successfully adopted the electronic standing order protocol and demonstrated meaningful improvement in care across study measures, including immunizations, mammogram rates, and screening for diabetes and osteoporosis. Technical competence and leadership were identified as key factors to optimally adapt and use the system.

D. National Resource Center (NRC) for Health IT Web Site

The NRC Web site (www.healthit.ahrq.gov) is a central means for the dissemination of findings from AHRQ’s health IT projects. Additionally, it is a platform to support outreach and delivery of information from AHRQ and to share expertise across the multidisciplinary fields that are engaged in critical aspects of health IT implementation and research.

The screenshot shows the AHRQ National Resource Center for Health Information Technology website. The header includes the U.S. Department of Health & Human Services logo and the AHRQ logo. The main navigation menu includes links for Home, About, Events, AHRQ-Funded Projects, Health IT Tools and Resources, Knowledge Library, Funding Opportunities, Health IT Brochure, and Contact Us. The central content area features a large graphic with the text "Workflow Assessment for Health IT toolkit" and "AHRQ-Funded Projects". Below this, there is a section for "Our Experts" with a photo of Jon White, M.D., and a list of RSS feeds. The footer contains contact information and a disclaimer.

The majority of material posted on the NRC Web site is generated by Health IT Portfolio-sponsored grantees or contractors. Information on the NRC Web site is organized by categories of information.

- **Events:** Past and upcoming health IT-related events sponsored by AHRQ are listed on the “Events” page of the Web site. Links to resources, such as meeting agendas and presentations, are provided as applicable. The list of events includes activities such as National Web Teleconferences that feature interactive presentations by experts in a particular field of health IT, and other important health IT activities.

- **AHRQ-Funded Projects:** Detailed information about each health IT-funded project is available on the Web site. Users may search for projects by geography, health care setting, type of health IT technology, target population, and principal investigator.
- **Health IT Tools and Resources:** AHRQ and its community of contractors and grantees have developed tools to help health care organizations plan, implement, and evaluate health IT. These freely available tools describe and recommend strategies for addressing some of the common challenges that organizations encounter when working with health IT systems. Tools include the Rural Health IT Adoption Toolkit, the Health IT Literacy Guide, the Health IT Survey Compendium, the Health IT Evaluation Measures: Quick Reference Guides, and the Health IT Bibliography.
- **Knowledge Library:** The Knowledge Library contains both evidenced-based and theoretical content gathered by health IT experts. This page provides information on a variety of health IT-related topics produced by both AHRQ-funded experts and provided by professional societies and nonprofit organizations.
- **Funding Opportunities:** AHRQ lists open FOAs for health IT and provides links to other Federal grant programs through NIH, the Department of Defense, the National Science Foundation, CDC, and the White House Official Grant Catalog, as well as links to funding Web pages for the Robert Wood Johnson Foundation, California Healthcare Foundation, and the Commonwealth Fund.

E. AHRQ's Office of Communications and Knowledge Transfer Dissemination Activities

OCKT staff plays a critical role in the synthesis

and dissemination of findings from the Agency's health IT research. Below is a summary of OCKT's marketing and media dissemination activities in 2010 in regard to specific deliverables from AHRQ Health IT Portfolio-funded grant and contract projects.

- **Media Outreach:** In 2010, OCKT issued two press releases on AHRQ-funded health IT research:
 - [AHRQ Study Shows Using Bar-Code Technology with electronic medication administration record \(eMAR\) Reduces Medication Administration and Transcription Errors, 5/5/10](#)



- [Innovative Software Cuts Costs and Time for States to Report Hospital Quality Information to the Public, 6/3/10](#)
- **Marketing Outreach:** In 2010, AHRQ conducted marketing outreach to key associations, Federal entities, advocacy groups, policy groups, and other stakeholders to promote relevant findings to the health IT industry. As a result, OCKT sent 48 e-mail announcements to various audiences on topics including:
 - [Report on Industrial and Systems Engineering:](#) In October 2010, OCKT promoted and disseminated a report titled [“Industrial and Systems Engineering and Health Care: Critical Areas of](#)

[Research.](#)” The report, funded by AHRQ and the National Science Foundation and developed by Professional and Scientific Associates under Contract No. 290-09-00027U, explored the critical intersection of industrial and systems engineering with health care research, and included a special emphasis on the supportive role of health IT.

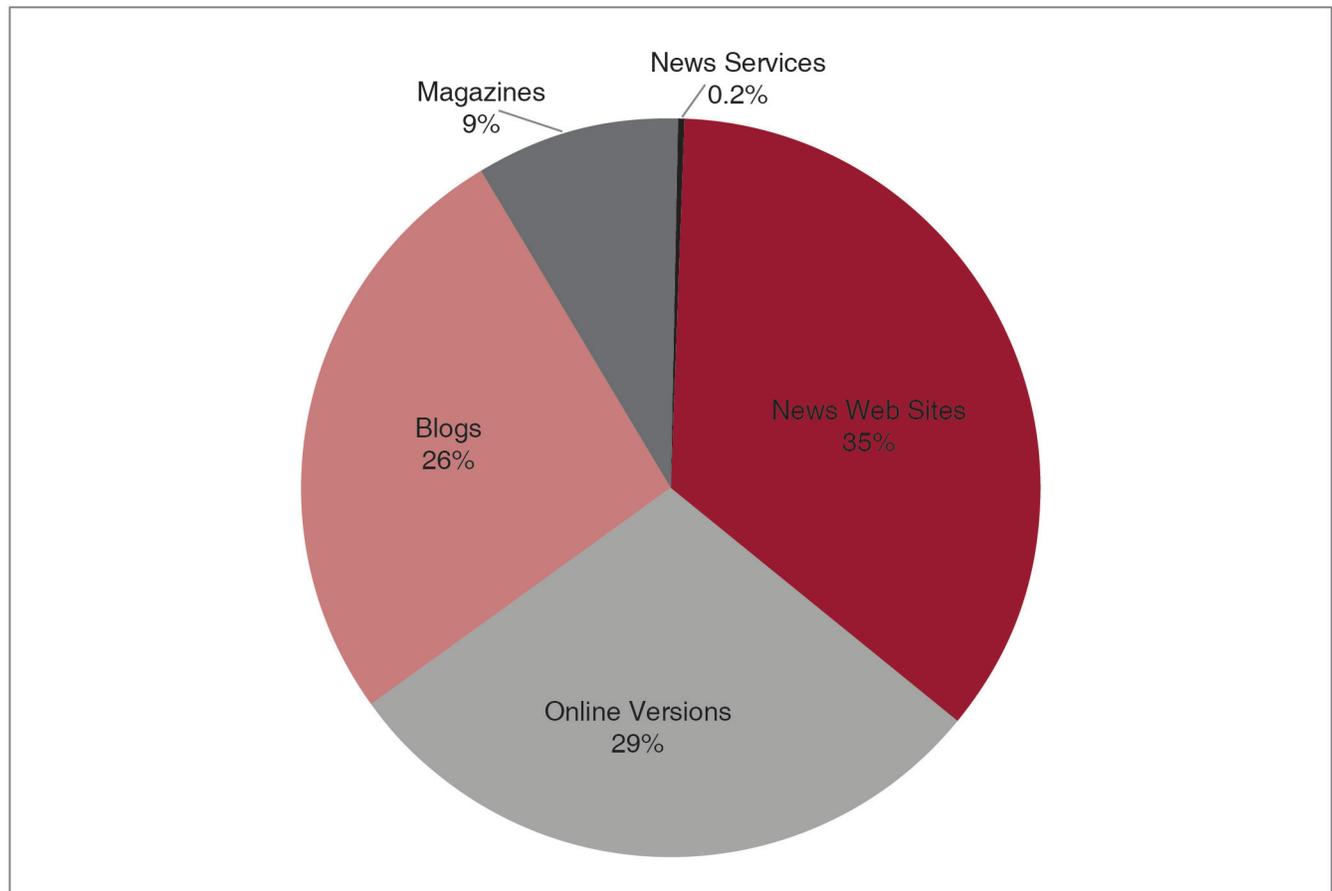
- **Report on Successes in Health IT:** In December 2010, OCKT promoted and disseminated a report titled [“Using Health IT: Eight Quality Improvement Stories.”](#) The report, funded by AHRQ and developed by Mathematica Policy Research under Contract No. HHS290200900019I, demonstrated how health IT can be used to improve efficiencies in health care delivery, quality of care, and access to care, and highlights the successes of eight AHRQ THQIT-funded projects:
 - A network of rural hospitals in Iowa successfully implemented an EHR and simultaneously redesigned many aspects of care delivery. (PI: Donald K. Crandall, Grant Number UC1 HS 015196).
 - A group of agencies created a Web-based system to improve access to pediatric health care in rural areas through a medical home. (PI: Gregory W. Bergner, Grant Numbers UC1 HS 016129 and P20 HS 014908).
 - Health care organizations and a county government in Oklahoma used a “network of networks” model to develop an easily-replicable, cost-effective HIE framework. (PI: Mark H. Jones, Grant Numbers UC1 HS 016131 and P20 HS 015364).
 - Emergency Medical Service agencies used a Web-based quality reporting system and CDS technology to improve the timeliness and quality of care provided to cardiac patients. (PI: Harry P. Selker, Grant Number UC1 HS 015124).
- Telemedicine clinics in New Mexico gave patients with hepatitis C access to high-quality local care. (PI: Sanjeev Arora, Grant Number UC1 HS 015135).
- Reduced use of emergency departments through a telemedicine system to connect schools and child care centers to primary care physicians. (PI: Kenneth M. McConnochie, Grant Number R01 HS 015165).
- A group of nursing homes implemented health IT into long-term care to improve quality and provide lessons learned for using health IT in new settings. (PI: Susan D. Horn, Grant Number UC1 HS 015350).
- The use of lower-cost medications was significantly increased by providing prescribers with real-time information on the relative costs of drugs. (PI: Joel S. Weissman, Grant Number R01 HS 015175).
- **GovDelivery Updates:** AHRQ continued to garner new subscribers for its health IT listserv using the GovDelivery e-mail subscription system. In 2010, AHRQ issued 26 updates on health IT topics to more than 33,000 subscribers, 5,000 of whom joined in 2010. Updates included the following:
 - An AHRQ study that shows EHRs can prevent and reduce diagnostic errors.
 - An AHRQ study that shows bar-code technology with eMAR reduces medication administration and transcription errors.

To sign-up to receive AHRQ Health IT News and Information

- Go to [AHRQ homepage](#)
- Select “Subscribe to updates,” located on the lower left corner
- Choose a subscription option

- A Web site to provide objective information about medical homes to policymakers and researchers.
- **Media Coverage:** In 2010, the AHRQ Health IT portfolio received media coverage in 107 different media outlets in 425 articles. As a result of media and marketing outreach efforts, AHRQ received broad media coverage from 40 mainstream and trade publications, including the American Journal of Public Health, Forbes.com, and Yahoo! News. Figure 7 below illustrates AHRQ health IT media coverage by type.
- **Blogs:** AHRQ received coverage from five technology and health-care related blogs: Health Affairs, HlStalk, HlStalkPractice, Mobihealthnews, and The Health Care blogs.
- **Podcasts:** [AHRQ's Healthcare 411](#) is a news series that features audio podcasts on consumer-oriented and timely topics such as health-care quality, safety, efficiency, and health IT. Weekly, 60-second radiocasts air on more than 1,000 radio stations nationwide and are shared with more than 700 professional organizations. Several podcasts have highlighted results from projects funded through the health IT Portfolio. In 2010, AHRQ issued the following health IT-specific podcast:
 - [Online Health Information](#): This podcast, posted on September 22, 2010, provides tips on how to find reliable online sources of health information. The podcast, as well as its transcript, are available for download.

Figure 7. Health IT Portfolio Media Coverage by Media Type in 2010



- **Videos:** The AHRQ Health Care Innovations Exchange has created a video series, [*AHRQ Health Care Quality: Frontline Innovators on Changing Care, Improving Health*](#). They feature brief video profiles of six health care professionals sharing human interest stories that illustrate the key elements of their innovations and the impact on the lives of individuals. One of the videos developed, *Remote Visits by Pediatricians for Sick Children at Inner-City and Other Child Care Centers/Schools Reduce Absences and Emergency Department Use*, highlights a Health IT Portfolio funded project: PI: Kenneth M. McConnochie, Grant Number R01 HS 015165.
- **Meeting Exhibits:** In 2010, the AHRQ Health IT Portfolio was promoted at nine annual meetings or conferences, including the American Medical Informatics Association and the Healthcare Information and Management Systems Society. Meetings at which AHRQ health IT information was featured include:
 - American Medical Informatics Association
 - Healthcare Information and Management Systems Society
 - Academy Health
 - American College of Physicians
 - American Public Health Association
 - American Osteopathic Association
 - American Academy of Family Physicians
 - American Academy of Physician Assistants
 - National Forum on Quality Improvement in Health Care
- **E-Newsletters and Research Activities**
 - ***AHRQ's E-Newsletter Patient Safety and Health Information Technology:*** This newsletter summarizes the Agency's research and programmatic activities.
 - Featured critical topics in health IT are listed below:
 - Statement on Certification programs
 - Meaningful use and setting standards for EHR incentive programs
 - AHRQ and ONC's Health IT Research Center
 - Transitions-in-care Web conference
 - AHRQ Web page on consumer health IT applications
 - AHRQ CDS podcasts
 - AHRQ in the health IT professional literature
 - ***AHRQ's Monthly Research Activities: Research Activities (RA)*** is AHRQ's monthly print and online newsletter that features articles and announcements on Agency products and projects and summarizes research findings from AHRQ-supported studies. During 2010, RA had nearly 30,000 print and more than 25,000 electronic subscribers. Health IT-related headlines in 2010 included:
 - Primary care physicians like e-prescribing systems but make little use of their advanced features.
 - E-prescribing has expanded among Massachusetts physicians.
 - Web-based programs help patients with diabetes feel empowered for self-care.
 - Longer use of EHR is not linked to improved quality of care
 - Hospital discharge software slightly boosts patient and physician satisfaction.
 - Nursing home users of IT start to see benefits.
 - Computer display helps reduce ventilator-associated pneumonia.
 - Drug monitoring may be improved by health IT and clinical pharmacists.

- Physicians with EHRs are more able to generate patient registries.
- Health IT improves timely availability of diagnostic information.
- Computerized provider order entry significantly reduces medication errors in an ambulatory setting.
- Physicians support HIE but are concerned about paying monthly fees.
- No additional benefit with remote offsite monitoring of intensive care unit patients.
- E-prescribing with CDS reduces medication errors.
- E-prescribing improves safety but with a small increase in physician time.
- CDS in EHR improves asthma care.
- Use of EHR features is associated with improved primary care measures.
- Regional HIEs must do more to attract small practices.

V. Conclusion

In 2010, work funded through the AHRQ Health IT Portfolio continued to make important contributions to the field of health IT. This research has furthered the evidence base on the impact of technology in health care. Evidence gaps, long an issue in health IT, are closing as a direct result of this work. The portfolio represents an important source of evidence on technology's ability to improve the quality, safety, effectiveness, and efficiency of health care. Important work has continued in the area of evaluating factors associated with successful implementation and utilization of health IT to inform others interested in adopting health care technology. Projects remain diverse, representing the full range of technologies and care settings, and geography, including organizations in 36 States and the District of Columbia.

2010 also marked the final year for active grants funded through the Transforming Health Care Quality through Information Technology (THQIT) initiatives. The two remaining grants of the 118 funded under these programs in 2004 and 2005 ended in 2010, bringing the funding for this inaugural program to a close. Through THQIT-funded grants, AHRQ proactively focused on health IT implementation among rural hospitals and community-based health care settings, many of which had little or no experience with health IT systems preparation and implementation. First-time and experienced grantees alike displayed a commitment to building integrated communities that support health IT implementation and use. AHRQ continues to disseminate lessons learned from these grants. For example, Mathematica Policy Research, Inc, with support through an NRC Task Order contract, developed eight individual case studies of THQIT grants, representing the positive potential of a diverse set of technologies

and applications, and identifying issues and challenges that must be addressed to realize the potential more broadly.

The Health IT Portfolio's second major grant funding initiative, the Ambulatory Safety and Quality (ASQ) Program, is also moving toward successful completion.

- All 15 of the Enabling Quality Management grants were functioning under a no-cost extension in 2010, with all but two ending in 2010.
- The original grant terms for both the Improving Quality through Clinician Use of Health IT and Enabling Patient Centered Care initiatives were set to end in 2010. However, the majority received no-cost extensions and only eight grants ended.
- The Improving Management of Individuals with Complex Health Care Needs grants, originally funded through 2011, all remain active.

At the close of 2010, there were three open grant PAs and one Special Emphasis Notice (NOT-HS-08-014). The PAs are supporting small research grants on the use of health IT to improve health care outcomes (R03s), exploratory, and developmental grants (R21s), as well as research and demonstration grants (R18s). The Special Emphasis Notice supports both the career development grants (K-awards) and the dissertation awards that serve to support up-and-coming health services researchers and examine how health IT can be used to improve health care quality in an increasingly complex fashion.

In total, 54 projects, including 26 grants and 28 contracts, ended in 2010. Seventeen grants and 10 contracts started in 2010.

2010 was a notable year for the six contracts funded to support State and Regional Demonstration Projects for Health Information Exchange. Originally funded in 2004 and 2005, the first of the projects from this inaugural program came to a close. Three projects ended in 2010, while the remaining three are slated to end in 2011. The goal of these contracts is to identify and support data sharing and exchange activities aimed at improving health care for patients and populations on a State or regional level. When the six contracts awarded, few established HIOs existed, affording an opportunity to study how these organizations are planned for, implemented, and sustained.

The AHRQ Health IT Portfolio staff partnered with Federal and private organizations to co-sponsor conferences, provide funding for projects, and share information. In addition, the Portfolio staff worked closely with OCKT staff to synthesize and disseminate many of the Health IT Portfolio activities during 2010, by way of presentations at major conferences and meetings, and by marketing project results through press releases and newsletters. Grantees and contractors also disseminated information about their projects in publications and on the NRC Web site, as demonstrated by the more than 200 newly reported grantee tools, products, and outputs in 2010.

This report highlights some of the successes and challenges that projects reported in 2010 as they conducted their research. Many of the projects are helping to address important gaps in the research and relevant literature about health IT implementation and its use, particularly in regard to impact on quality, safety, and improved health care outcomes and the potential to translate these findings to other health care settings. Through the NRC, AHRQ provides TA to health IT projects to help them overcome obstacles, achieve their research and grant objectives, and disseminate their findings, including one-on-

one TA and Webinars for targeted groups of grantees. In addition to multiple TA Webinars, the AHRQ Health IT Listserv was launched in 2010 to promote peer-to-peer knowledge sharing among grantees and to create a community of experts where topics of shared interest could be discussed.



Individual summaries of project activities and preliminary findings from 2010 are available on the [NRC Web site](#). The summaries are an excellent resource for implementers of health IT, prospective research applicants, and others interested in the challenges and successes of health IT implementation and use in terms of research and practical application. They describe the characteristics of successful research projects and PIs' abilities to adjust and persevere through the real-world challenges and setbacks encountered in health IT implementation, use, and evaluation.

Appendix A – History of AHRQ-Sponsored Funding Opportunities

AHRQ's Health IT Portfolio has consisted of three major grant funding initiatives: the now-closed Transforming Health Care Quality through Information Technology request for applications (RFAs), the Ambulatory Safety and Quality RFAs, and most recently, the Health IT-Oriented Program Announcements. These funding initiatives are described below, followed by the history of AHRQ-Sponsored Health IT Funding Opportunity Announcements (FOAs) and Special Emphasis Notices (SENs).

Transforming Health Care Quality through Information Technology (THQIT) RFAs.

Beginning in 2004, the THQIT program supported different aspects of organizational and community-wide health IT implementation-related activities. The goal of the program was to elucidate various stakeholders' perspectives and demonstrate the value of health IT implementation and use, particularly in rural hospitals and community-based health care settings. All of the grants in this category were awarded through RFAs that are now closed. The THQIT initiative included 118 grants funded through the following four RFAs:

- ***THQIT Planning Grants (P20, HS-04-010):*** Designed to support the planning and development phases of health IT infrastructure for communities interested in preparing for effective exchange of health information across multiple community health care organizations. All 38 THQIT planning grants were completed by end of 2006.
- ***Initial THQIT Implementation Grants (UC1, HS-04-011):*** Intended to assess the extent to which health IT implementation contributes to measurable and sustainable improvements in patient safety, cost, and overall quality of care. All 40 implementation grants were completed prior to 2010.
- ***THQIT Implementation Grants II (UC1, HS-05-013) (this was limited competition among the 38 awardees of the Planning Grants):*** Designed to serve as implementation grants for institutions that had received and completed a planning grant. Two implementation II grants completed in January 2010; the remaining 14 implementation II grants were completed prior to 2010.
- ***THQIT Value Grants (R01, HS-04-012):*** Intended to generate insight from various stakeholders' perspectives on direct and indirect benefits when health IT is used in the delivery of health care, including those related to clinical outcomes, safety, quality, cost savings, effectiveness, and efficiency. All 24 value grants were completed prior to 2010.

Ambulatory Safety and Quality (ASQ) RFAs.

The ASQ initiative, established in 2007, supported grants to improve the safety and quality of ambulatory health care in the United States. The five components of the ASQ initiative were: 1) risk assessment in ambulatory care, 2) improving quality through clinician use of health IT, 3) enabling patient-centered care through health IT, 4) enabling patient safety and quality measurement through health IT, and 5) improving management of individuals with complex healthcare needs through health IT. All of the grants in this category were awarded through RFAs that are now closed. The ASQ initiative included 69 grants funded through the following four RFAs:

- ***Enabling Patient-Centered Care (PCC) Through Health IT RFA (HS-07-007):*** Designed to investigate novel methods or evaluate existing strategies for using health IT to create or enhance patient-centered models of care in the ambulatory setting. Patient-centered care is responsive to the

needs and preferences of individual patients, provides patients with access to their medical information, and empowers patients to be active participants in care decisions and in the daily management of their health and illnesses. Grantees were expected to demonstrate how patient-centered care can improve health outcomes, patient safety, and patients' reported experience with care. Projects focused on shared decisionmaking; patient-clinician communication; providing patients, their families, and/or clinicians access to patient's medical information across transitions in care; and/or patient self-management of chronic conditions. This initiative also included set-aside funding for projects that focused on medication management, which worked with Practice-Based Research Networks, or that focused on vulnerable populations and the care settings that serve them. Sixteen total grants were awarded in 2007. All 16 of these grants were active in 2010. Two projects ended in 2010, including one that received a 3-month no-cost extension; the remaining 14 received a 1-year no-cost extension and are therefore scheduled to end in 2011.

- ***Improving Quality Through Clinician Use of Health IT (IQHIT) RFA (HS-07-006):*** Designed to investigate novel methods or evaluate existing strategies for clinician use of health IT in ambulatory settings to improve outcomes through more effective CDS, medication management, or care delivery. Applicants were encouraged to demonstrate the ability of EHRs and medication management systems to effectively move evidence-based information to the point of care, including the development and utilization of machine-actionable, evidence-based clinical information to providers and participation in health information exchanges. Applicants were encouraged to consider projects that focus on the impact of health IT

on outcomes in ambulatory settings and across high-risk transitions of care, the relationship between health IT and workflow redesign, systemic barriers to health IT adoption, care for patients with multiple chronic conditions, and improved use of effective alert strategies for decision support. Twenty-four total grants were awarded in 2007. All 24 of these grants were active in 2010. Six of these projects ended in 2010, including one that received a 3-month no-cost extension. The remaining 18 projects received a 1-year no-cost extension and are scheduled to end in 2011.

- ***Enabling Quality Measurement (EQM) Through Health IT RFA (HS-07-002):*** Intended to develop safety and quality measures in ambulatory care settings, automate quality measurement, demonstrate the ability of electronic data systems, expand potential safety and quality measures, and demonstrate improved ability to export data for reporting performance on measures and improvement. Of the 17 total grants awarded through this RFA in 2007, 2 grants ended in 2009 and the remaining 15 projects were awarded no-cost extensions. Of these, 13 ended in 2010, and 2 are scheduled to close in 2011.
- ***Improving Management of Individuals with Complex Healthcare Needs through Health IT RFA (HS-08-002), also referred to as "Management of Complex Patients" (MCP):*** Serves to demonstrate the ability of health IT to assist clinicians, practices, systems, and patients and families in improving the quality and safety of care delivery for individuals with complex health care needs in ambulatory care settings, particularly in high-risk care transitions. The long-term goal of this effort is to ensure that patients receive appropriate care and management for prevention and treatment of priority conditions. Twelve total grants were awarded in 2008. All 12 of these

grants were active through 2010 and are scheduled to end in 2011.

Health IT-Oriented FOAs. In September 2008, AHRQ issued three health IT-focused FOAs. The goal of these incremental funding opportunities, which included training and development of individual research skills, was to support projects that could achieve measurable and sustained improvements in quality and safety of health care in ambulatory settings and in transitions of care through the development, implementation, and use of health IT. The applicable settings in which this funding could be applied included: ambulatory, transitions in care between ambulatory settings, or transitions in care between ambulatory and non-ambulatory settings. For the purpose of these FOAs, ambulatory care settings include: health care clinician offices, outpatient clinics, outpatient mental health centers, outpatient substance abuse centers, urgent care centers, ambulatory surgery centers, community-based, school, or occupational health centers, safety-net clinics, pharmacies, homes, independent living centers, and long-term residential care facilities.

New proposals for the R03 and R21 FOAs are still being accepted by AHRQ, while the R18 FOA closed in May 2011. The first grants of these FOAs were awarded in September 2009. The following are general overviews about each of the FOAs.

- ***Small Research Grants to Improve Healthcare Quality through Health IT (R03) (PAR-08-268):*** Supports different types of small research studies up to 2 years, including: 1) small pilot and feasibility or self-contained health IT research projects, 2) secondary data analysis of health IT research, and 3) economic prospective or retrospective analyses of health IT implementation. A total of seven R03 projects were awarded in 2009 and 2010. All were ongoing in 2010.
- ***Exploratory and Developmental Grant to Improve Health Care Quality through Health IT (R21) (PAR-08-269):*** Provides funding for health IT exploratory and developmental research projects up to 2 years that support the conduct of short-term preparatory, pilot, or feasibility studies. Health IT implementation research demonstration grants are included in this category. The R21 grants are intended to be more comprehensive and broader in scope than the relatively smaller, self-contained health IT research projects supported by the health IT R03 FOA. A total of 12 R21 projects were awarded in 2009 and 2010, and all were ongoing in 2010.
- ***Utilizing Health IT to Improve Health Care Quality Grant (R18) (PAR-08-270):*** Supports demonstration research grants up to 3 years that study health IT implementation and use to improve the quality, safety, effectiveness, and efficiency of health care in ambulatory settings and transitions between care settings. A total of 16 R18 projects were awarded in 2009 and 2010, and all were ongoing in 2010.

In April 2011, AHRQ published two new health IT-related FOAs to supplement its existing FOAs and SEN. These funding opportunities are designed to fund basic health IT research and fill gaps in the field that will lead to improved design of health IT systems.

- ***Understanding Clinical Information Needs and Health Care Decision Making Processes in the Context of Health Information Technology (R01):*** Provides funding for research aimed at elucidating the nature of cognition, task distribution, and work in health care delivery settings. Research projects funded under this FOA will address current knowledge gaps regarding the understanding of health care providers' information needs and health care decision making processes. Ultimately, funded research projects will lead to the development and dissemination of

evidence that will lead to appropriate design of health IT solutions that truly support clinical needs and lead to better outcomes.

- ***Understanding User Needs and Context to Inform Consumer Health Information Technology Design (R01)***: Provides funding for projects that will help build a knowledge base about consumers' personal health information management needs and practices and related design principles. Projects will demonstrate how their research will lead to a better understanding of user needs and how their findings will impact consumer health IT design.

Other Health IT-Funded Grants. In addition to the grants described above, the Health IT Portfolio funds additional grants with a health IT focus, which are solicited through the following FOAs:

- ***Career and Dissertation Awards***: Designed to enhance the careers of health IT-focused researchers through K-awards and research dissertation grants (R-36). These grants support the career development of clinical and research doctorates who focus their research on one of three priority health IT research areas: 1) health IT to improve the quality and safety of medication management, 2) health IT to support patient-centered care, and 3) health IT to improve health care decisionmaking. There were 12 active career and dissertation awards in 2010; four R36, six K08, and two K01. Of these, three R36 projects ended in 2010 and the remaining nine projects are ongoing. In 2010 there were three new awards: one R36, one K08 and one K01.
- ***Conference Support Awards***: AHRQ continues to support conferences through its Grant Programs to support both small (PA-09-070 Small Grant Program for Conference Support [R13]) and large (PAR-09-257 Grant Program for Large Conference Support

[R13] and [U13]) conferences to help further its mission to improve the quality, safety, efficiency, and effectiveness of health care for all Americans. In 2010, there were three active R13 grants under the Health IT Portfolio, one funded in 2008 for a large conference and two funded in 2009 for small conferences. Of these, two grants ended in 2010 and one remains ongoing.

- ***AHRQ Health Services Research (R01) Purpose***: In March 2007, AHRQ issued an agency-wide FOA (PAR-09-231) for ongoing extramural grants for research, demonstration, dissemination, and evaluation projects to support improvements in health outcomes, strengthen quality measurement and improvement, and identify strategies to improve access. In 2010, there was one active R01 grant under the Health IT Portfolio, funded in 2009.
- ***AHRQ Health Services Research Demonstration and Dissemination Grants (R18)***: AHRQ supports large research demonstration and dissemination projects, specifically in the AHRQ portfolio priority areas of interest, including the Health IT portfolio. This FOA supports real world demonstration projects that evaluate factors (facilitators and barriers) associated with successful health IT implementation and use and ultimately improve health care outcomes. Facilitators and barriers to health IT implementation may include adequacy of engagement and training of health care staff, patients, and family in the use of health IT; characteristics of the health care setting; organizational processes and practices; workflow; adequacy of health IT implementation plan; nature of technical support of health IT; integration of new health IT with pre-existing health IT; and other factors.

- ***Centers for Education and Research on Therapeutics (CERTs) (U18):*** AHRQ was given responsibility for administering the CERTs demonstration program authorized by Congress as part of the Food and Drug Administration Modernization Act of 1997 (Public Law 105-115). AHRQ awarded grants to support the first four centers in September 1999, and the full CERTs program was established as part of the [Healthcare Research and Quality Act of 1999](#) (Public Law 106-129). CERTs conduct research and provide education to advance the optimal use of drugs, medical devices, and biological products; increase awareness of the benefits and risks of therapeutics; and improve quality while cutting the costs of care. CERTs consist of 14 research centers and a coordinating center. In 2010, there was one active CERT program under the Health IT Portfolio, funded in 2007.

Table A-1. AHRQ-Sponsored Health IT Funding Opportunity Announcements and Special Emphasis Notices

Publication Number	Title and Hyperlink	Year Awarded	Number of Grants Active as of 2010	New Grant Proposals May be Submitted
PAR-HS-08-268	Small Research Grant to Improve Health Care Quality Through Health Information Technology (IT) (R03)	2009	6	Yes ¹¹
PAR-HS-08-269	Exploratory and Developmental Grant to Improve Health Care Quality Through Health Information Technology (IT) (R21)	2009	13	Yes ¹¹
PAR-HS-08-270	Utilizing Health Information Technology (IT) to Improve Health Care Quality (R18)	2009	16	No ¹²
NOT-HS-08-014	Special Emphasis Notice: Career Development (K01, K02, K08) and Dissertation (R36) Grants Focused on Health Information Technology (IT)	2009	12	Yes ¹¹
PAR-09-231	Small Grant Program for Conference Support (R13)	2009	2	Yes ¹³
PAR-09-070	AHRQ Health Services Research (R01)	2009	1	Yes ¹⁴
PAR-09-257	AHRQ Grant Program for Large Conference Support (R13) and (U13)	2008	1	Yes ¹⁴
RFA-HS-08-002	Ambulatory Safety and Quality Program: Improving Management of Individuals with Complex Health-care Needs Through Health IT (R18)	2008	12	No
RFA-HS-07-004	Centers for Education and Research on Therapeutics (CERTs) (U18)	2007	1	No
RFA-HS-07-007	Ambulatory Safety and Quality: Enabling Patient-Centered Care Through Health IT (R18)	2007	16	No
RFA-HS-07-006	Ambulatory Safety and Quality Program: Improving Quality Through Clinician Use of Health IT (R18)	2007	24	No
RFA-HS-07-002	Ambulatory Safety and Quality Program: Enabling Quality Measurement Through Health IT (R18)	2007	15	No
RFA-HS-05-013	Limited Competition for AHRQ Transforming Health-care Quality Through Information Technology (THQIT)—Implementation Grants	2005	2	No
RFA-HS-04-010	Transforming Healthcare Quality Through Information Technology (THQIT)—Planning Grants	2004	None	No
RFA-HS-04-011	Transforming Healthcare Quality Through Information Technology (THQIT)—Implementation Grants	2004	None	No
RFA-HS-04-012	Demonstrating the Value of Health Information Technology	2004	None	No

11. Active until November 17, 2011.

12. Ended May 8, 2011.

13. Active until October 23, 2012.

14. Active until January 8, 2012.

Appendix B – AHRQ-Sponsored Health IT Contracts

Table B-1. AHRQ-Sponsored Health IT Contracts Active in 2010

Number of Contracts Active as of 2010	Title
One-Time Requests for Proposals	
6	State and Regional Demonstrations in Health Information Technology
2	Clinical Decision Support Services
Master Contracts Through Which Active Health IT Portfolio Task Orders Were Issued:	
3	Program Evaluation and Analysis Task Order Contract (PEATOC)
8	Primary Care Practice-Based Research Networks (PBRNs)
5	Evidence-Based Practice Care Centers
8	Accelerating Change and Transformation in Organizations and Networks (ACTION)
3	Blanket Purchasing Agreement (BPA) for Support Services
9	National Resource Centers Task Orders for “knowledge-generating” contracts
10	Other Task Orders
4	Interagency Agreements
1	Purchase Order



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