# Contracting Out in a Complex Network: An Effectiveness Analysis of EPC Program I

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# CHAPTER 1

## INTRODUCTION

Since the dawn of Western medicine in ancient Greece, the first noted physician Hippocrates based medical practice on "scientific evidence." Hippocrates and his followers systematically studied, documented and shared the methods used to treat an ailment and the outcome of the patient (Lorimer, 1907). This led to the tradition of using evidence to prescribe medical treatment still employed today (Chang, 2007). However, one major difference between the present day and ancient Greece is the rate at which medical advancements are made (Ibid.).

Medical studies have undergone massive growth. From 1970 to 1995, for example, the number of published clinical trials more than doubled (Sackett & Rosenberg, 1997). The number of published medical studies that reported medical advances amounted to a clinician needing to read 19 articles per day, 365 days a year to keep up (Ibid.). Today, more than 83,000 medical trials are underway in the U.S. (National Institutes of Health [NIH], 2010). Although the rapid growth in clinical trials has led to many medical breakthroughs, it also has produced increased health care expenditures and conflicting evidence for health care professionals, third party payers, patients, and policymakers to toil over when making health care decisions (Centers for Medicare and Medicaid Services [CMS], 2009; Sackett & Rosenberg, 1997).

At the same time, advances in information technology allowed for the invention of large databases to track medical practices — highlighting widespread variation in everyday health care delivery in states and localities throughout the U.S. Many researchers contended that the majority of these health care practices were inappropriate and not based on scientific evidence (Cochrane, 1972; Brook, 1988; Wennberg, 1987, 2005). Such variation was also linked to the federal government spending billions of dollars for inappropriate care and even medical errors

(Gray, 1992; Wennberg, 1997, 1998). Many health care administrators and scientists estimate that these trends have continued, and most likely accelerated, giving rise to the evidence-based medicine (EBM) social movement (Wennberg, 2005) through the increased use of networks including individuals from both the public and private sectors (Cochrane Collaboration, 2002).

## Problem Statement

Many organizational theorists in a variety of disciplines have contended that a distinct organizational form–the network organization–has emerged in nearly every area of research and development, service delivery, and product manufacturing (Barringer & Harrison, 2000; Goldsmith & Eggers, 2004; Gormley & Balla, 2003; Peters, 2001).[1] For instance, rather than an agency operating under the direction of an internal hierarchy (DiMaggio, 2001; Kenis & Provan, 2006), it acts in a network of multiple interacting entities that often includes public and private organizations (Jones, Hesterly & Borgatti, 1997; Goldsmith & Eggers, 2004).

While government contracting out and studies about this phenomenon have increased during the past two decades (Provan, Fish & Sydow, 2007), still little is known about how effective government is when it contracts out and operates in broad and complex networks of non-governmental entities (see, e.g., Bardach, 1998; Cigler, 2001; Mandel, 2001; Kenis & Provan, 2006; Provan & Milward, 2001; Provan, Huang & Milward, 2009; Provan, Fish & Sydow, 2007). Scholars also assert that additional studies are needed in the area. Considerable research examining why networks form has been conducted at the organizational level of analysis (Barringer & Harrison, 2000; Goldsmith & Eggers, 2004), but Provan et al. (2007) argue that little has focused at the network level. Additionally, Provan et al. contend that empirical

[1] Relevant disciplines include business administration, engineering, political science, and public administration See, e.g., Barringer & Harrison, 2000; Ebers, 1997; Goldsmith & Eggers, 2004; Jones, Hesterly & Borgatti, 1997; Gormley & Balla, 2003; Kettl & Milward, Eds., 1996; Kickert, Klijn & Koopenjan, Eds., 1997; Peters, 2001; Sydow, Van Well & Windeler, 1997.

studies of whole networks are needed at the network level of analysis to assist policymakers in making decisions about similar programs.

This dissertation reports the results of one such investigation, which examined a U.S. federal agency's contracting experiences in evidence-based health care. The Agency for Healthcare Research and Quality (AHRQ) is a unit of the U.S. Department of Health and Human Services (HHS). Among other tasks, AHRQ supports the development and dissemination of evidence about current best practices in health services delivery through its Evidence-based Practice Center (EPC) programs that contract out its work and operate in broad and complex network of government and non-government entities.

## Purpose

The purpose of this study was to examine the extent to which AHRQ's EPC Program I was effective in supporting the translation of evidence reports and disseminating the products to the public (i.e., health care professionals and providers, patients, and policymakers) by contracting with public and private not-for-profit ("private" hereafter) entities to do the work. This dissertation also sought to examine the extent to which the evidence reports and derivative products were publicly accessible, and it explored why Program I was as effective as it was. Given the breadth of the study, the research was limited to examining the effectiveness of EPC Program I, not Programs II and III. However, one of the objectives of this research is to serve as a basis for future effectiveness analyses of EPC Programs II and III.

To help explain the effectiveness of a government program that operated in a broad and complex network of public and private entities located at various levels and regions, I developed an integrated conceptual framework consisting of ideas and more than one theory to examine such nuances. While William T. Gormley's ideas (1989) about bureaucratic control mechanisms

served as the basis for the study's propositions and hypotheses, I also used theories about network effectiveness from multiple organizational scholars (e.g., see Agranoff & McGuire, 2001; Granovetter, 1973; Hansen, 1999; Provan & Milward, 1995, 2001, 2003) to inform and structure this study (see Chapter Three).

## Topic Summary

AHRQ, created in 1989, is the health services research (HSR) arm of HHS.[2] Among other tasks, AHRQ supports the development and dissemination of evidence-based medicine (EBM) about current best practices in health care delivery through its EPC programs. The word "supports" in this context refers to money that AHRQ provides to the public and private health organizations with which it contracts to: (a) rate the quality of published medical research and synthesize the findings of the best evidence into "evidence reports," (b) translate the reports into quality improvement products, and (c) disseminate the products, making them widely accessible to the public. Each step is important in increasing the quality of U.S. health care delivery.

Through its EPC programs, AHRQ is responsible for translating evidence reports and disseminating the derivative products. The primary objectives of the EPC programs are to rate the quality of published medical studies and synthesize the data into evidence reports, translate those reports into more useable products for everyday health care delivery, and disseminate the products in the form of clinical practice guidelines, performance measures, educational programs, and reimbursement policies in a manner that makes them widely available to the public. EPC Program I (1997 to 2002) contracted with public agencies and private not-for-profit ("private" hereafter) organizations to do most of the work of translating the evidence reports into products

[2] HSR is a relatively new discipline that is devoted to improving everyday health care outcomes in areas including access to care, cost, and quality (Field, Tranquada & Feasley, Eds., 1995).

and of disseminating and providing public access to the products. In doing so, the program operated in a network of primarily non-governmental entities.

## Significance

Perhaps surprisingly, no such analysis of AHRQ's EPC Programs (I, II, or III) has taken place. In 1993, to assist policymakers in making decisions about federal programs, Congress passed the Government Performance and Results Act (GPRA).[3] GPRA required that by fiscal year 1999, each federal agency submit a strategic performance plan to the Office of Management and Budget. By March 31, 2000 and each fiscal year thereafter, federal agencies also were required to present the president and Congress with reports on how well they met their performance goals for the previous fiscal year.[4]

To date, all of the Agency's programs have submitted self-reports on their effectiveness each year to fulfill the GPRA requirement (AHRQ, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010). However, no Agency-wide measurement standard exists for translation, dissemination, or accessibility in the program self-assessments. Moreover, each program typically chose to report individual instances of effectiveness, rather than effectiveness analyses for overall program for the fiscal year[5] (Ibid.).

Although AHRQ's GPRA Strategic Performance Plans and its GPRA Performance Reports[6] provide somewhat lucid definitions of the terms "translation" and "dissemination" (see

[3] See the Government Performance and Results Act of 1993, Sec. 1116, (a).
[4] Ibid.
[5] No analysis of the EPC Program's effectiveness has been published. Since this effectiveness analysis of AHRQ's EPC Program is the first of its kind, I had no standard on which to base translation, dissemination, and accessibility effectiveness, which is another reason why a study such as this was needed. Also, when comparing the evaluations published by the Government Accountability Office and similar entities, this study is distinct due to its comprehensiveness including the development of a conceptual framework that I used to help explain EPC Program I's effectiveness.
[6] See the Agency's GPRA Strategic Performance Plans for fiscal years 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, and 2011 and the Agency's GPRA Performance Reports for fiscal years 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, and 2010. Each has been examined for this dissertation.

the Glossary of Terms in Appendix A), they did not measure the amount of time it took for EPCs and contractors from EPC Program I to translate evidence reports. Yet the amount of time it took EPC Program I and the non-government entities with which it contracted to translate and disseminate may be crucial information. Determining the circumstances under which translation, dissemination, and public accessibility might have been delayed or accelerated can assist in explaining why EPC Program I was as effective as it was. Such information also might help predict the Agency's outcome effectiveness in increasing the quality of U.S. health care delivery practices.

Equally important, AHRQ's GPRA Strategic Performance Plans and Performance Reports did not assess the degree of free online public access to the products generated during its EPC Programs (I, II or III). Free public accessibility to credible products supported by government programs such as AHRQ's EPC Programs can serve as a useful starting point on which patients and health care professionals might base their health care decisions. A variety of information treatments and tests increasingly are available on the internet. Patients, providers, and purchasers seek more direct access to health care information (Pew Foundation, 2008). For example, the use of PubMed and Medline databases increased by 100% when the National Library of Medicine (NLM) provided free online public access just to the abstracts of medical research (NLM, 2010). General accessibility of those products generated during AHRQ's EPC Program I appear critical to more effective health care delivery.

In addition, the results from this study can assist in making decisions about government support of evidence-based health care and similar government programs that contract out in operating in complex networks of public and private entities. Furthermore, this study contributes to the sort of empirical work that Provan et al. (2007) have called for in the network literature.

## Organization

This dissertation is organized in the following manner. In Chapter Two, I present an overview of the EBM social movement and how it influenced the creation of AHRQ and the development of the EPC Program. The chapter also discusses the legislative dynamics surrounding the creation of AHRQ. Finally, I describe how the Agency was structured to support the development and dissemination of evidence reports and derivative products via EPC Program I and the means through which the evidence reports and products were made accessible to the public.

Chapter Three includes the conceptual framework on control mechanisms and ways of measuring effectiveness in networks and the bodies of theories that I relied on for the analysis. The chapter also describes how I use the term "effectiveness"; it discusses approaches to evaluation and how I chose which approach to employ. Additionally, this chapter introduces the study's dependent variables, used to measure the effectiveness of EPC Program I. The chapter concludes by introducing the variables that could help explain variations in program effectiveness.

Chapter Four presents the propositions and hypotheses that drove the overarching research design of the study. It also describes the specific type of case study inquiry used, the data collection methods, and the approach to data analysis. It concludes with discussions of triangulation, issues of validity, and the limitations of the study.

The findings on EPC Program I effectiveness are reported in Chapter Five. The chapter begins with is an overview of the evidence-based topics selected during Program I to provide a frame of reference, followed by the findings on translation effectiveness, the extent to which

EPC Program I achieved dissemination effectiveness, and the degree to which Program I fulfilled its pubic accessibility goals.

Chapter Six explores the possible relationships between the explanatory variables and Program I's effectiveness, examining each of the dissertation's three propositions and three hypotheses. Finally, in Chapter Seven, I present the study's conclusions including an epilogue and the possible implications of the findings. I also discuss areas of future research.

# CHAPTER 2

## AHRQ'S EPC PROGRAM I

In 1988, John Wennberg, M.D., presented testimony before the Senate Finance Committee's Subcommittee on Health, declaring that the magnitude of variation in health services delivery in the U.S. threatened not only the health of the national economy but also the lives of patients.[7] This perspective helped influence a fundamental shift in how members of Congress perceived U.S. health care delivery problems and the type of legislation needed (Gray, 2003).

This chapter provides the context in which EPC Program I emerged and how it worked. After an overview of the evidence-based medicine (EBM) social movement, which influenced the creation of AHRQ and the development of the EPC Program, the legislative dynamics involved in creating AHRQ are discussed. The chapter concludes with a description of the Agency's organization and procedures.

### The EBM Social Movement

In 1973, Wennberg, Director of Vermont's Regional Medical Program, began tracking widespread variation in health care delivery in the state and within localities. This led him and his colleagues to document similar variations in health care delivery throughout the U.S. For example, a woman in one market had a 70% probability of undergoing a hysterectomy by age seventy. Yet under the same medical conditions, but in a different region of the country, or even in the same state in a neighboring locality, she had a 20% chance of undergoing a hysterectomy.

[7] Congressional testimony, prepared statement of John Wennberg, Dartmouth University, before the U.S. Senate Finance Committee, Subcommittee on Health, 1988.

Wennberg and others[8] found similar variations in nearly every surgical procedure, regardless of patient sex or age. He and a group of researchers at the Rand Corporation began publishing papers contending that a major proportion of health care delivery carried out in the U.S. was not based on scientific evidence (Gray, 2003).

Such high rates of variation in health care delivery practices, however, were not limited to the U.S. Archibald Cochrane, an epidemiologist with Britain's National Health Service, also was tracking variations in medical practices. Cochrane argued that the high degree of variation in medical practice could be minimized through physicians' use of evidence from randomized control trials (RCTs) to inform everyday medical practices (Cochrane, 1972). To do this Cochrane devised a methodology for synthesizing and rating RCTs as a means for evaluating scientific evidence, which he called systematic reviews. This marked the beginning of the EBM movement. With him, researchers began developing systematic reviews from RCTs, creating voluntary research networks around the world known as the Cochrane Collaboration. One such researcher was David Sackett, a physician at McMasters University in Canada, who was a leader in the development of EBM (Gray, 2003).

The EBM movement aims to minimize variation in everyday health care delivery practices and rising health care costs in the U.S. and abroad (Wennberg, 2005). EBM is most commonly defined as "…the conscientious and judicious use of current best evidence from clinical care research in the management of individual patients" (Sackett et al., 1996, p. 71). EBM is a movement of necessity, responding to public demands to minimize variation in medical practice and to contain rising health care costs. Since most patients typically suffer from more than one condition — for example cataracts along with glaucoma — they usually are not

[8] Other researchers, including Kerr White, an epidemiologist at Johns Hopkins University; David Eddy, who later joined Stanford Medical Center; and numerous additional health services researchers raised similar comfortable questions about the variation in medical practices.

included in clinical trials, which therefore do not fully represent physicians' patient population (Sackett, 1996). Thus, developing EBM usually requires two different types of expertise. One form of expertise is needed to rate the quality of published scientific studies (e.g., clinical trials) and to synthesize the findings into an evidence report (typically conducted by health care scientists), and a second is required to *translate* the evidence report into a product that can be used to make decisions in everyday health care delivery (usually carried out by practitioners) (McQuay et al., 1997; Sackett et al., 1996). Such expertise is typically gathered through forming research *networks* comprised of health care scientists and practitioners located throughout different regions of the world who rate and synthesize the quality of published medical studies as a means for evaluating scientific evidence and publish their findings for use in everyday medical practice (Eddy, 1998; Sackett, 2005). More specifically, the steps in EBM development include:

1. Identifying the focus of and an audience for the systematic review (evidence report) and product
2. Retrieving and using statistical techniques to evaluate the scientific studies retrieved
3. Synthesizing and summarizing the benefits and risks of the proposed interventions in these studies (e.g., Adderall to treat children who suffer from attention-deficit hyperactivity disorder)
4. Translating the review into a clinical practice guideline or a reimbursement policy
5. Implementing the guideline or policy into health care delivery systems

(Source: Sackett, 2005.)

Today, the rates of widespread variation in health care delivery still are roughly the same as they were almost four decades ago. (O'Hare, Rodriguez, Hailpern, Larson & Kurella, 2010; Song, Skinner, Bynum, Sutherland, Wennberg & Fisher, 2010; Wennberg, 2007). Most experts agree that rising health care costs and variation and medical errors stem from overuse, underuse, and misuse of medical care.[9] Congress began to understand the severity of high rates of variation in everyday medical treatment and appropriated more money for the development of evidence-based health services for the purpose of making the information widely accessible to health professionals, patients, and policymakers (Gray, 2003). An example of this type of congressional involvement included the creation and funding of AHRQ, located within the U.S. Department of Health and Human Services.

## Legislative Dynamics

The Omnibus Budget Reconciliation Act (1989) created the Agency for Health Care Policy and Research (AHCPR).[10] The new unit was fashioned to be a public health service agency within HHS. AHCPR's statutory purpose was to conduct "research on health care outcomes, effectiveness, and appropriateness, including a Forum for Quality and Effectiveness in Healthcare programs to develop medical practice guidelines" (Omnibus Budget Reconciliation Act, STAT. 3. 1989). Available evidence suggests that Congress did not intend that AHCPR would be either a regulatory or a standard-setting body. It was not a policymaker but to inform policymakers in the public and private sectors. (Reauthorization of AHCPR, 1999).[11]

[9] See e.g., Ebell, Siwek, Weiss, Woolf, Susman, & Ewigman, 2004; Eddy, 2005; Field et al., Eds., 2003; Gray, 2003; Sackett et al., 1996; Sackett, 1997; Song et al., 2010; Wennberg, 1984; Wennberg & Fisher, 2004.
[10] The Healthcare Research and Quality Act of 1999 changed AHCPR's name to the Agency for Healthcare Research and Quality. The bill passed both houses on 19 November 1999.
[11] Congressional testimony, prepared statement of Charles N. Kahn III, President, Health Insurance Association of America before the House Committee on Commerce Health and Environment, Subcommittee on Reauthorization of the Agency for Health Care Policy and Research, April 29, 1999.

By 1995, AHCPR had become entangled in a string of controversies that jeopardized its survival. Throughout the budget and appropriations processes in the first session of the 104th Congress, the Agency came under attack for its association with the Clinton administration's 1993-94 health reform endeavor (Reauthorization of AHCPR, 1999). [12] The Republican-controlled House Budget Committee's report on the budget resolution for fiscal 1996 stated: "The Agency is supposed to support research and information dissemination on health care services and technology, medical effectiveness, and patient outcomes, but performed an advocacy role in the health care debate the past two years while its funding increased from $125 million in 1992 to $163 million in 1994" (Reauthorization of AHCPR, 1999).[13] Congressional opposition to AHCPR funding also was stimulated by complaints from physicians' organizations, such as the American Medical Association (AMA) and its more than 90 specialty groups, which argued that any meaningful work the Agency carried out was already being conducted by private entities (AMA, 1996; Kahn, 1998, 2003). Such organizations contended that there was no need for the existence of AHCPR (Kahn, 1998, 2003).

In 1996, in response to congressional unease, AHCPR issued requests for proposals (RFPs) in publications such as the *Federal Register* that solicited private, non-profit, and public entities to nominate, develop, translate, and disseminate evidence-based practices through the newly established EPC Program (Gray, 2003; Kahn, 1998). By 1997, AHCPR awarded contracts primarily to private entities, thereby launching EPC Program I. This initiative redirected how the Agency operated by contracting with private entities to do the work. It reoriented AHCPR's role in developing quality improvement tools (i.e., clinical practice

[12] House Committee on Commerce Subcommittee on Health and Environment, Reauthorization of the Agency for Health Care Policy Research, 106th Cong. 1st sess., 29 April 1999.
[13] Congressional testimony, prepared statement of Brian Lindberg, Executive Director, Consumer Coalition for Quality Health Care before the House Committee on Commerce, Subcommittee on Health and Environment, 29 April 1999.

guidelines and performance measures), educational programs, and reimbursement policies from operating without contracting out the development and dissemination of these products to contracting with public and private organizations to do the work (Kahn, 1998). On December 6, 1999, President Clinton signed the Healthcare Research and Quality Act of 1999, reauthorizing AHCPR until the end of fiscal 2005.

One of the obvious differences that this legislation made was that AHCPR was renamed. This corrected the misleading notion that the Agency "controlled" federal healthcare policies by removing "policy" from its name. Instead, the statute added the word "quality" and repositioned AHRQ as the lead federal agency tasked with facilitating all federal quality development efforts aimed at health services research (AHRQ, 2000).

The Act also charged the Agency with supporting the formulation of evidence-based practice by contracting with public and private organizations. Moreover, the legislation emphasized that AHRQ was to develop, disseminate, and provide public access to scientific knowledge about evidence-based practices. However, the Agency was not to mandate guidelines or standards for measuring quality (Gray, 2003).

Prior to the passage of the Healthcare Research and Quality Act, AHCPR had been operating without authorization since 1995. Yet, from 1995 through 1999, it received operating monies through the congressional appropriations process.

## AHRQ

Since its inception in 1989, the Agency has been located in Rockville, Maryland, with satellite offices in Washington, D.C. In fiscal year 2010, AHRQ had an operating budget of more than $372 million (see Table 1). The Agency had nearly 300 full-time staff and was

comprised of nine major offices and centers (see Figure 1). Since reauthorization of AHRQ in 1999, more than two-thirds of its budget has been awarded as contracts and grants to teaching

(Table 1 about here.)

hospitals, researchers at universities, and research institutions throughout the U.S. The Agency's EPC Program is a unit lodged in the Center for Outcomes and Evidence (AHRQ, 2008 [current as of July 2010]).

(Figure 1 about here.)

## EPC Program I

Through the EPC Program, AHRQ has the responsibility for supporting the translation of evidence reports and disseminating derivative products. An evidence report ranges anywhere from 200 to 600 pages in length and is either a systematic review or a meta-analysis of a specific evidence-based topic that is nominated by a public or private organization that the EPC Program selected to fund for further development. At the start of Program I, a derivate product of an evidence report referred to translation in the form of a quality improvement tool that could be used directly in everyday health care delivery, including a clinical practice guideline, education program, or a reimbursement policy. The Agency later extended the meaning of an evidence report translation to a published article that summarized the findings of an evidence report. However, the goal of Program I was for its partners to translate the reports into products that could be directly applied in the delivery of routine medical care to patients, which was likely to have a more immediate and direct impact on the quality of everyday health care delivery.

**Topic nominations.** In 1996, AHRQ requested nominations for evidence-based topics for its EPC Program. The Agency solicited requests for nominations through its mailing list, on

its website, on major healthcare databases such as the National Library of Medicine, and in the *Federal Register*.

In February 1997, 12 evidence-based topics were selected for funding. The National Advisory Council for Healthcare Research and Quality Panel[14] along with expert staff members from AHRQ's EPC office developed the criteria for selecting evidence-based topics and determined which topics to fund each year (AHRQ, 2000).

The panel used two criteria in deciding whether to fund an evidence-based topic. First is the topic's "substantive value" to the U.S. population, where "substantive value" refers to the severity, frequency, and costs of treating a particular disease or illness in the U.S. The second criterion involved the technical capacity of the topic's nominator. The EPC Program calls an organization that nominates an evidence-based topic that is selected for funding a "partner" (AHRQ, 2000) (see Figure 2). The technical ability of a prospective partner refers to its expertise both for translating an evidence report into a quality improvement tool that could be used in everyday health care delivery and for then disseminating the findings to its members or affiliates. Although the EPC Program solicited nominations for topics once a year, it also accepted topic nominations on an ongoing basis for future consideration (AHRQ, 2001). When the panel selected a topic for funding, it reviewed whether the organization(s) that nominated the topic not

(Figure 2 about here.)

only had the needed technical ability to translate the evidence report generated from the topic into a quality improvement product, but also had agreed to assist the EPC in developing research

[14] The National Advisory Council for Healthcare Research and Quality Panel is a 21 member team of private sector experts who represent health care consumers, plans, providers, and researchers. Panel members are appointed by the secretary of the U.S. Department of Health and Human Services to serve three year terms. Additionally, the assistant secretary of HHS and seven representatives from federal agencies that address health care issues serve in an ex-officio capacity on the panel, including the Centers for Disease Control, Centers for Medicare and Medicaid Services, Department of Defense, Department of Veterans Affairs, Food and Drug Administration, National Institutes of Health, and the Office of Personnel Management (AHRQ, 2000 [Current as of July 2010]).

questions for the topic, serving as peer-reviewers of completed evidence reports (only for those unrelated to the topics partners nominated), and, most important here, both translating the evidence report into a quality improvement product that could be directly used in the delivery in the routine health care to patients and disseminating the product to its membership and affiliates in a "timely" manner.[15] The Agency described these responsibilities of a partner in its GPRA Strategic Performance Plans and in EPC Program work documents. Furthermore, the prospective partner provided AHRQ's panel with a description of its technical ability in these areas when it nominated a topic for funding. Evidence-based topics selected for funding were publicly announced, typically in the form of an Agency press release.

The EPC Program stated that it would review the partners' past performance of their roles and responsibilities, including translating evidence reports and disseminating the resulting product. It is worth noting that AHRQ did not mention the extent or the means through which the partner should provide access to the product—only that the partner should translate the evidence report and disseminate the product to its membership in a timely manner.

Equally important, AHRQ only used the threat that it would not select a topic from a partner again if the partner failed to fulfill the agreement it made with the Agency when it nominated the topic. The Agency could not hold a partner legally liable for fulfilling the responsibilities that the partner agreed to when nominating a topic that was selected for funding. This differs substantially from the relationship that AHRQ had with the 12 EPCs.

**Evidence-based Practice Centers.** In December 1996, the Office of Management and Budget (OMB) released AHRQ's 137-page solicitation for requests-for-proposals (RFPs) for EPCs. AHRQ also solicited RFPs through its mailing list, on its website, on major healthcare

[15] Although the Agency did not define the meaning of the term "timely," data gathered for an evidence report become obsolete in five years unless the information contained in the report is either validated or updated (AMA, 2000; NGC, 2000).

databases such as the National Library of Medicine, and in the *Federal Register*. The Agency asked for proposals from health care organizations to participate as part of a team of EPCs that would draft evidence reports on medical topics that were critical to the quality of U.S. health care delivery.

In February 1997, AHRQ awarded 12 five-year EPC contracts to organizations in the U.S. and Canada (see Table 2). The majority of organizations with which AHRQ contracted are teaching hospitals that are well-known for their expertise in health care, including such

(Table 2 about here.)

entities as Tufts/New England Medical Center and the University of California San Francisco/Stanford Medical Center.

The National Advisory Council for Healthcare Research and Quality Panel along with staffers from AHRQ's EPC office also developed the criteria for selecting EPCs and determined which organizations were awarded EPC contracts (AHRQ, 2000). However, the director of the EPC Program decided which EPCs received contracts to carry out the work on each evidence-based topic selected for funding.

The panel's criteria for selecting an organization to serve as an EPC included two primary components. The internal component is an assessment of the organization's full time staff, including leading experts, areas of expertise, and the method to be used for conducting research. In addition, the entity's capabilities are evaluated. The prospective EPC's capabilities were measured by the number of publications, range of clinical interventions, and experience in areas such as biostatistics, cost-effectiveness analysis, decision analysis, and meta-analysis. Second, the external component examined the number and types of clinics, hospitals, and health policy organizations with which the prospective EPC collaborates. The term "collaborate" here

means working with and sharing ideas and analyses. Such collaborative entities also were assessed using relevant dimensions of the internal component (AHRQ, 2000).

The panel also determined the criteria for selecting evidence-based topics and decided annually which topics would be selected for funding. The topics were publicly announced, and the director of Program I solicited RFPs from EPCs for the evidence-based topics selected for funding. The EPC Program termed such RFPs "Task Order Contract Schedules." Only one Task Order Contract Schedule was drafted per topic. In addition, only the 12 EPCs were eligible to submit a proposal to carry out the work of EPC contracts.

The EPC Program director determined which EPC to award a contract to once the EPCs had submitted proposals to conduct work on a topic. The director's criteria for determining the EPCs to receive contracts included the EPC's area of expertise, its leading staffers' expertise, methods and the organizations with which the EPC collaborated.

Next, the director of the EPC Program drafted a contract for each evidence-based topic selected for funding and submitted the contract to OMB for final review. Once the OMB approved, it issued a federal contract number for the document and produced the final draft of the EPC contract. If satisfactory, the director of the EPC Program signed the contract and presented it to the EPC selected to carry out the work. After the EPC signed the contract, it was legally enforceable.

To oversee contract fulfillment, the program director assigned a task order officer to each selected topic (see Figure 3). EPC Program I had 12 task order officers in all, and one officer was

(Figure 3 about here.)

assigned to each contract. The task order officers are full time staff members at AHRQ, many of whom hold multiple advanced degrees in such areas as medicine and public health (e.g., M.D., M.P.H., R.N.) or epidemiology and public administration (e.g., Ph.D. and M.P.A.).

It was standard for an EPC contract to include the names of both the task order officer assigned to oversee the contract and the partner organizations that nominated the topic. The contract also included timelines for the EPC to develop relevant research questions, reviews of related literature, data analysis, and drafts of the evidence report, as well as a pay schedule. Equally important, the contract stated that the EPC selected to draft the evidence report also was responsible for assisting the partner(s) in translating the evidence report into a derivative product (OMB, 2000).

However, a timeline for assisting the partner(s) in translating the evidence report into a product was not included in the schedule of the contract. This is somewhat surprising. The EPC was provided with a schedule for all other activities that it was legally bound to complete in the contract. Since the contract schedule stated the EPC was responsible for assisting in the translation of the evidence report, it could be held legally bound to assist in such efforts. Yet, the Agency had no such contract with the partners.

**Partner organizations.** The relationship between AHRQ and the entities serving as partners was less clear. For what the Agency could legally hold the partners accountable became blurred, partly because the OMB did not issue a formal contract as it did in the case of an EPC organization. Thus, if the partner failed to fulfill the agreement it made with the EPC Program when it nominated the selected topic, AHRQ could only threaten that it would not select any further topics nominated by the partner. The agreement the partner entered into with AHRQ when it nominated a topic for funding included translating the completed evidence report into a

derivative product and disseminating the product to its membership. Both translation and dissemination were vital to the overall effectiveness of EPC Program I.

In addition, AHRQ did not include provisions for providing full public access to partner — or EPC — authored products generated from Program I. Providing full public access to the evidence-based research and products also was vital to the effectiveness of EPC Program I. Not only were the evidence reports and products generated from Program I paid for with taxpayers' dollars, but providing full public accessibility to such evidence-based research and practices was vital to the success of the Agency in fulfilling its overall mission.

In all, during Program I 143 partners nominated 93 evidence-based topics that AHRQ selected for funding. In many instances, more than one partner nominated a single evidence-based topic. The partners in such cases included a mixture of organizational entities located in different regions, levels of the U.S. federal system, and sectors. For example, among the partners that nominated one evidence-based topic that AHRQ decided to fund were the NIH (multiple regions, national level, public sector), the Vermont Department of Mental Health (northeast region, state level, public sector), Blue Cross Blue Shield of Massachusetts (northeast, national level, private sector), the American Pharmaceutical Association (various regions, national level, private sector), the American Psychiatric Association (multiple regions, national level, private sector), and Kaiser Permanente of Northern California (northwest, national level, private sector.

**Summary**

Nearly 40 years ago, widespread variation in medical delivery practices including undertreatment, overtreatment and medical errors and rising health care costs associated with it were found in studies conducted in the U.S. and abroad. Such variation remains roughly the same today.

The EBM social movement began in response to the high degree of variation in health care delivery practices and rising medical expenditures. By rating and synthesizing the findings of published medical studies for use in everyday health care delivery, the EBM movement aims to minimize variation in everyday medical delivery and rising health care costs. The well-document magnitude of variation in medical care and the EBM movement helped to create AHRQ and its EPC Program.

With this discussion as a foundation, the next chapter introduces the dependent variables the study used to tap Program I's effectiveness and the conceptual framework.

# CHAPTER 3

## THE CONCEPTUAL FRAMEWORK

This chapter examines how the dissertation uses the term "effectiveness," it also discusses approaches to evaluation and how I chose which approach to employ. Then it introduces the study's dependent variables, which tap the effectiveness of EPC Program I. It next explores factors that may help explain variations in program effectiveness.

### Effectiveness and Approaches to Evaluation

The organizational theory, public administration, and public policy literatures generally agree that a program's effectiveness is the extent to which it achieves a particular goal (e.g., Patton, 2002, Provan and Milward, 2001, 2003; O'Toole and Meier 2005; Schneider & Ingram, 1997; Shadish, 1997). Goals can be viewed as generally stated in an organization's formal documents such as its mission statement and strategic plan (Drucker, 2002). Goals also can be found in a public organization's authorizing statute (Schneider & Ingram 1997). Goals can be normative through direct connection to democratic values (Stone, 2002), such as equity or responsiveness to the needs of the citizenry. Goals also may be symbolic, acknowledging a particular demand of the general public. Additionally, goals may be put forth by elected officials as a means of encouraging certain types of behavior by public servants (Schneider and Ingram, 1997).

As Chapter One mentioned, the purpose of the dissertation is two-fold: (1) to examine the extent to which AHRQ's EPC Program I was effective in supporting the goals of translation, dissemination, and public access; and (2) to explore why it was as effective as it was. As such, the study is an effectiveness evaluation of the initial outputs of a federal governmental

intervention rather than a procedural assessment (Vedung, 2000, p. 35).[16] Vedung classifies approaches to effectiveness evaluation as substantive assessments (2000, pp. 36-7, 307).[17] The most common assessments that center on the effectiveness of government interventions are: (1) side-effects, (2) goal-free, (3) client-oriented, (4) stakeholder, (5) comprehensive, and (6) goal-attainment evaluations (2000, p. 36-82).

This section briefly describes these approaches to evaluation. Next it presents criteria for choosing an approach to evaluation for the dissertation. Finally, based on these criteria, an assessment of the usefulness of each of the six approaches to evaluation is provided.

**Description of Evaluative Approaches**

A side-effects evaluation focuses on the assessment of unintended results that occurred outside of a program's target area (i.e., its intended area of output) (Vedung, 2000, pp. 49-58). In a goal-free evaluation, the predetermined goals of a program are omitted as the guiding criteria in conducting the assessment; instead the results, either planned or unplanned, are included in evaluating the overall output of the program (Patton, 2002, pp. 169-70; Vedung, 2000, pp. 59-62).

A client-oriented evaluation centers on the question of whether a program satisfies client needs. This evaluation typically involves a prescriptive theory of valuing (Vedung 2000, pp. 66-9), in which the analyst decides which needs are most valid. A client-oriented evaluation also can focus on client concerns, desires or expectations (2000, p. 66).

Somewhat closely related is a stakeholder evaluation (Vedung, 2000, p. 67). This approach is concerned with the actors that have an interest in or are influenced by a program. It resembles a client-oriented assessment, with the major difference being that it is larger in scope.

[16] A procedural assessment evaluates factors such as a program's legality, equity, due process, and representativeness (Vedung, 2000, p. 35).

[17] Economic assessments also are included in the broad category of substantive evaluations. Economic assessments focus on the monetary costs of a program or policy and include cost-benefit analysis and the ratio of output per unit of input (Vedung, 2000, 36-7, 307).

While the client-oriented evaluation is concerned with assessing the needs of one group of affected interests, the stakeholder approach is geared to a larger set of actors that can include political opponents and proponents of a program, agencies, interest groups, and citizens who are impacted by the program (Vedung, 2000, p. 70).

A comprehensive evaluation is an assessment that combines both process and substantive evaluation. In this approach the analyst describes the program that is being evaluated. Then, the analyst assesses the program across three different stages of the policy process: (1) the antecedent phase, the period prior to the policy being implemented; (2) the transaction phase, the period during which the program is implemented; and (3) the outcome phase, the time directly after delivery of the program (Vedung, 2000, pp. 62-6) (see Appendix B).

The goal-attainment model (GAM) is sometimes referred to as an impact assessment or results monitoring (Vedung, 2000, p. 37). GAM entails three distinct activities: (1) stating and operationalizing a program's goals, (2) measuring the degree to which the goals were achieved, and (3) evaluating the extent to which the program's resources (e.g., technical expertise, available funds, the level of discretion granted to the agency by policymakers) influenced the degree of goal achievement (Patton, 2002, pp. 170, 560; Vedung, 2000, pp. 38-40).

GAM applies descriptive theory by using goals that are predetermined by others (e.g., elected officials, the American Medical Association, the Consumer Coalition for Quality Health Care, the Health Insurance Association of America) as the benchmarks against which to assess a program's achievement (Patton, 2002, p. 570; Vedung 2000, p. 39). It is worth noting that prescriptions can be made based on the findings of a GAM evaluation once the assessment is completed.

## Criteria of Usefulness

The criteria for assessing the usefulness of the six approaches to evaluation for this study included: (1) the central focus of an approach, (2) its feasibility, and (3) the ease of communicating the approach and its findings to program administrators, policymakers and researchers. I eliminated a type of evaluation from consideration if it failed to meet the first criterion. It is crucial that the central focus of an approach to assessment be consistent with the objective of the analysis. This central focus is so important that it is often termed the "organizer" of the evaluation (Bemelmans-Videc, Rist & Vedung, 2003; Vedung, 2000, pp. 49-69, 304). The organizer is the fundamental question or objective that is to be examined in an evaluation (Vedung, 2000, pp. 46-69).

**Central focus.** I sought to assess the effectiveness of EPC Program I by starting with the authorizing legislation for the programs in AHRQ. I chose to use the objectives articulated in the Agency's authorizing legislation as the basis for assessing AHRQ's EPC Program I for normative reasons. We live in a representative democracy.[18] Elected officials are responsible for making policy decisions and are held accountable by voters. In turn, public administrators are responsible for carrying out statutory objectives that are articulated by elected officials. Normatively, it is important that civil servants and political appointees act in ways that are

[18] The traditional view of representative democracy in many instances is referred to as "overhead democracy." Emmette Redford contends that overhead democracy is a belief that political control ought to run through one clear line of hierarchy (Redford, 1969, p. 71). The line of political control begins with the citizenry, runs to their elected representatives in Congress, to the president, to political appointees, and finally to civil servants. Career officials are viewed as subordinate actors in this hierarchy of control. Further, this view contends that civil servants should lack policymaking ability and be instruments of the will of their political superiors (McEldowney & Murray, 2000, p. 100). Redford, however, contends that tight hierarchical control as viewed by an overhead democracy perspective is too simplistic. "It does not adequately define administration as it operates in Washington" (Redford, 1969, p. 72). He instead argues that administrative action in large part is not hierarchical, but is part of a "web of interrelationships among civil servants, the president, political appointees, Congress, and congressional staff" (1969, pp. 72-80).

consistent with decisions made by elected officials. Therefore, I assessed the effectiveness of EPC Program I by starting with the authorizing legislation for the programs in AHRQ.

**Feasibility.** The feasibility of an approach to evaluation also is important to an analysis because it involves the range of what is to be included in an assessment. For example, the feasibility of this particular study might have been threatened if the evaluation included every program in AHRQ or in the U.S. Department of Health and Human Services.

**Ease of communicating.** The ease of communication of an assessment and its findings to program administrators and policymakers is also an important criterion in selecting an approach, since the results of the evaluation may be used to inform future decisions about a program or policy.

## Assessment of the Approaches

Applying these criteria to the effectiveness approaches permitted me to determine which approach was especially well suited for studying EPC Program I. The organizers of the side-effects, goal-free, client-oriented, stakeholder, and comprehensive approaches to evaluation did not coincide with the central focus of the dissertation. The side-effects evaluation emphasizes the assessment of the unintended results of a governmental program, rather than its intended results. Meanwhile, the goal-free approach to assessment concentrates on results without considering the statutory objectives of a governmental program (Bemelmans-Videc et al., 2000, pp. 59-62).

The organizer of the client-oriented approach to evaluation is the needs, desires, or expectations of the client. Identifying the focal client of EPC Program I not only is difficult, but congressionally articulated objectives arguably are more important than a single client's or customer's objectives. The client or customer may have a narrower view of what is needed or

expected from a governmental program than do elected officials. Further, most clients or citizens (the term I prefer to use when discussing matters that pertain to the public) rarely have the opportunity to be presented with testimony by other members of the citizenry and interest groups as members of Congress do. In many instances congressional hearings are held prior to drafting legislation. At that time, members of interests groups and other citizens may testify before Congress.

Similarly, the stakeholder evaluation does not rely centrally on formal objectives to base an assessment. Instead, the needs, desires and expectations of those that might be impacted by a program are used as the benchmarks on which to base an evaluation. This is significantly different from using formal objectives that elected officials have articulated.

Finally, the comprehensive approach to evaluation focuses on measuring the achievement of a program's formal objectives. However, it does so by assessing each stage of the policy process, from planning the program to implementing it to producing the program's output and outcome. This study's focus was limited to assessing the EPC Program's output rather than evaluating the process of each phase of the policy.

The goal-attainment model (GAM) is the approach to substantive evaluation that evidently was best suited to the dissertation. It met all three of my criteria: central focus, feasibility, and ease of communicating the results. First, the strength of GAM is grounded in the theory of representative democracy. GAM assesses whether a program's formal goals are fulfilled. As mentioned earlier, the goals of an agency often are found in its authorizing legislation. Congress articulates the agency's formal goals in its authorizing legislation; before the legislation becomes law, the president must sign it. These elected officials are responsible

for representing the will of the citizenry in a manner that is consistent with the Constitution (Rohr, 1990, 1998, 2002; Rosenbloom, 2000).

Second, applying GAM was feasible. It allowed for manageability of the scope of the study by adding or subtracting the number of factors (e.g. programs, actors) that were included in the evaluation. Third, the findings from GAM can be communicated to administrators and policymakers in a comprehensible manner and can inform similar studies in the future.

Even though a major criticism of GAM is that formal program goals often are incomplete because they can be written in an ambiguous manner (Patton, 2002; Vedung 2000, pp. 43-4), the validity of this criticism depends on to which statute one is referring. AHRQ's authorizing legislation, for example, is written in a relatively clear and operational manner. Other criticisms of GAM include its lack of attention to unintended program outcomes and issues of cost-effectiveness (Vedung, 2000, pp. 36, 46-7). Also, as noted earlier, GAM does not evaluate a program's processes or its equity, due process, or representativeness (2000, pp. 43, 48). These are valid concerns, and they are acknowledged to be limitations. Even with these limitations, however, I elected to use GAM for the study because it met each of my criteria for assessing the usefulness of an approach to evaluation (see Appendix C).

## The Dependent Variables

In applying GAM, the objectives stated in the Agency's statute were the organizer of this assessment. The objectives the statute articulated for the programs in AHRQ were the benchmarks with which to measure the program's effectiveness. Thus, the first task of the assessment was to specify the Agency's goals. Somewhat surprisingly, AHRQ's formal goals were easy to decipher from its authorizing statute (U.S. Public Law 106-129). Since the EPC Program is merely one unit in a center at AHRQ, not every section of the legislation set forth

goals that were relevant to the translation, dissemination, and public accessibility of Program I's derivative products. The applicable sections only discuss dissemination of the evidence-based products being "widely accessible"[19] to the general pubic (e.g., health care providers, patients, and policymakers) as the intended output.

In order to meet the formal goal of dissemination, however, an additional step is needed — translation. Translation is a key component of the process of disseminating the derivative products of evidence reports. Evidence reports range from 200 to 600 pages in length, a length that makes it difficult for end users to employ them in everyday healthcare delivery. Translation of the evidence reports, then, must precede dissemination. Once disseminated, access to the derivative product by a potential user who is looking for the information also is necessary.

The extent to which translation, dissemination, and public accessibility have taken place, then, were the dependent variables of the analysis. Dissemination of a derivative product and access to that product by the general public may appear to be one and the same but analytically the two are distinct. A derivative product can be disseminated through major peer-reviewed journals, healthcare databases, or websites. Yet the degree of public access may differ depending on the entity that disseminated the product and the communication mechanism(s) employed.

With these three dependent variables in mind, attention turns to possible explanatory factors for Program I's effectiveness.

### Program I Effectiveness: Possible Explanatory Factors

To help explain the effectiveness of AHRQ's EPC Program I, it is worth noting that I apply William T. Gormley's (1989; Gormely & Balla, 2003) ideas on bureaucratic control mechanisms to inform my examination of Program I in two different ways. First, I apply them at

[19] As noted earlier, the Agency's mandate did not define the term "widely accessible." See the Glossary of Terms for my definition in Appendix A.

the level of analysis that he intended, where the focus is on external efforts (by Congress and non-AHRQ HHS staff) to control the Agency. Here, I discuss the mechanisms with which others sought to control AHRQ, and how the use of these particular controls might have influenced EPC Program I's effectiveness. Second, I employ Gormley's ideas at a different level of analysis than he did, by examining the one control mechanism that was available to AHRQ under EPC Program I.

**Gormley's Ideas**

Gormley's (1989; Gormley & Balla, 2003) work on bureaucratic control mechanisms helps inform and structure the analysis of particular factors that might help explain EPC Program I's effectiveness. Gormley presents a typology of bureaucratic control mechanisms that includes three types of mechanisms: coercive, catalytic, and hortatory.

*Coercive control* can include detailed statutory directives and compulsory penalties such as fines if, for example, instructions for compliance are not met. Coercive control allows agencies only low degrees of discretion. Gormley (1989; Gormley & Balla, 2003) argued that particularly since the 1970's, elected officials in the U.S. have over-controlled public agencies through coercive control mechanisms (2003, p. 212). He contends that in most circumstances, high levels of coercive control have been used to the detriment of an agency's creativity and overall effectiveness (Gormley, 1989, p. 30). In many instances, this is because coercive control is not well suited to the agencies to which it is applied; the result often is poor performance.

In most circumstances, Gormley advocates using the least constraining of the three types – catalytic control. *Catalytic mechanisms* call for solving a problem, but do not direct that any specific actions be taken to solve it (Gormley, 1989, p. 12; Gormley & Balla, 2003, pp. 117-8). For example, if money is allocated to address a particular problem, but no specification is given

about how to use the money, then the control strategy could be viewed as a catalytic control mechanism. When catalytic mechanisms are applied, officials in an agency have more discretion as to the actions to take in solving the problem. Gormley posits that in many circumstances, this discretion affords bureaucrats the opportunity to be creative in finding solutions to particular problems and thus will most likely increase effectiveness. Catalytic controls include freedom of information statutes, public hearings, ombudsmen, proxy advocates, and environmental impact statements (Gormley, 1989, pp. 4, 12). Conversely, both internal and external catalytic control mechanisms can be aimed at increasing an agency's awareness of citizens' ideas about and perspectives on problems while enhancing their involvement with the agency.

Another example of a catalytic control is when a government agency is controlled externally by the citizenry rather than internally by elected officials or political appointees. Arguably, AHRQ serves as an example of a government organization that is influenced by external groups, particularly during the five turbulent years prior to its reauthorization in 1999 (see Chapter Two). Due to political pressure exerted by interest groups (e.g., the AMA) about AHRQ's developing clinical practice guidelines, the Agency responded by eliminating its own work in this area and instead launched EPC Program I to support guideline development by the private sector.

Gormley warns, however, that the most frequent criticism of the use of catalytic control is that it can be unsuccessful in increasing an agency's effectiveness and can lead to "ritualistic exercises in symbolic politics" (1989, p. 17). Critics also contend that its use puts agencies at risk of succumbing to the pressure of powerful interest groups with narrower goals (1989, p. 18).

*Hortatory mechanisms* can fluctuate between being more like coercive and more like catalytic controls (1989, pp. 11-13). Hortatory control mechanisms typically have embedded

incentives and sanctions. An incentive can be in the form of money. For instance, if a hortatory control leans more toward being catalytic, threats to cut off an agency's funding will not be enforced. If, however, the threat actually is enforced and funding is revoked, then the hortatory control is more similar to a coercive control. As Gormley puts it, hortatory controls "are catalytic controls with a bite, and coercive controls with an escape hatch" (1989, pp. 12-3). Hortatory mechanisms offer incentives to the agency to achieve particular goals, while providing flexibility about whether threats actually will be enforced.

The fundamental premise on which Gormley's ideas about bureaucratic controls are based is that they should be strategically chosen to fit the circumstances to which they are to be applied.[20] He emphasizes that all too often bureaucratic controls are applied haphazardly to agencies without examining the unintended consequences of using particular types of control. Most important is Gormley's prescription that those who work in the policy process be more mindful of the specific organizational characteristics of an agency and the context in which it operates. This level of specificity about an agency or a problem can be attained through more thoughtful examination of the focal agency.

I use Gormley's ideas about mechanisms of bureaucratic control as the basis for examining six factors that may help explain EPC Program I's levels of effectiveness: (1) the high degree of coercive control over the Agency that Congress exerted, (2) the decentralized network in which the actors of EPC Program I worked, (3) the complex network in which the EPC Program operated, (4) the weaker ties that connected the EPC Program actors, (5) the financial resources available to AHRQ each year, and (6) the control that was available to it. I believed

[20] The idea here is that not all government agencies and programs are the same. Likewise, the problems that government agencies are mandated to fix are not the same.

that each factor was critical to the Program's effectiveness, and in what follows I discuss them in the order that I expected them to be important.

**AHRQ's Authorizing Legislation: Coercive Controls**

I believe Gormley would view AHRQ's authorizing legislation as containing examples of coercive control. Congress wrote this statute in such a detailed manner that it left the Agency's officials with little discretion to develop innovative ways to increase program effectiveness. First, the legislation may have influenced effectiveness by requiring that AHRQ's programs operate mostly outside of the federal government. Congress mandated that AHRQ work within a broad and complex network that includes non-profit and for-profit organizations. As discussed earlier, the statute requires that AHRQ *support* the formulation and dissemination of evidence-based practices and the making of such practices widely accessible to the public by contracting with public and private organizations in an effort to form multiple partnerships. These partnerships were to be comprised of multidisciplinary research centers and provider-based research entities that were to be located in geographically diverse regions throughout the U.S.[21] I viewed this as one of the most important factors that might have influenced AHRQ's effectiveness, since these requirements limited agency officials' discretion in designing ways to translate and disseminate evidence-based practices.

Second, Congress applied another coercive mechanism by including compulsory deadlines in the authorizing legislation. For example, "No later than December 2000 the Agency's Director shall develop and publish a description of the methods used by the Agency

[21]The statute did not define the terms "multidisciplinary," "networks," or "geographically diverse regions." My definitions appear in the Glossary of Terms. The authorizing legislation also requires that AHRQ contract with centers and research networks that have expertise in the area of evidence-based health services research (§911). McMaster's University is among a handful of organizations that spearheaded such development (*British Medical Journal*, 2001). Although McMaster's University is not located in the U.S., it does have expertise in evidence-based research and was included among the entities under contract to AHRQ.

and its contractors…" (U.S. Public Law 106-129). This is one of many deadlines in the statute. By using compulsory deadlines, Congress indicated that it would be monitoring AHRQ (U.S. Public Law 103-62).[22] This may well have been intimidating to agency officials and, for instance, may have limited their willingness to experiment or improvise when implementing the EPC programs.

In general these legislative efforts suggest:

Proposition 1: The high degree of coercive control over AHRQ that Congress exerted will be associated with lower levels of program effectiveness.

The possible effects of coercive legislative control also may flow from the organizational constraints that Congress placed on AHRQ. As mentioned above, Congress mandated that AHRQ form a broad and complex network by contracting with both private and non-profit entities located throughout diverse areas of the U.S. for the purposes of supporting the development and dissemination of evidence-based practices and of making such practices widely accessible to the public. In an attempt to follow the statute, the Agency in EPC Program I entered into partnerships with more than 100 different organizations. These entities were located across multiple geographic regions, levels of government, and sectors (public and private). In this sense, EPC Program I is an example of a distinct organizational form, a network. For instance, rather than an entity operating under the direction of an internal hierarchy (DiMaggio, 2001; O'Toole, 1997; O'Toole et al., 2005, pp. 46-8), it acts in a network of multiple interacting units that often include public and private entities (Jones, et al., 1997, pp. 914-16; Meier & O'Toole, 2001, pp. 271-2; 2003, p. 689). Milward & Provan (2003) contend that network effectiveness can be difficult to achieve due to conflicting regulations of grants and contracts that

[22] Through GPRA, of course, the president and Congress also monitor the performance of all federal agencies (Government Performance and Results Act of 1993).

the actors are operating under in a single network. In a comparative study of mental health service networks in four U.S. cities, Provan & Milward (1995) found that more centralization within a network was linked to greater program effectiveness. Such centralization increased the clarity of network goals and allowed entities within the network to complete necessary tasks that led to overall higher effectiveness (1995, 2001, 2003). In order to attain a centralized network, a central actor is needed (1995, 2001).

Provan & Milward (2001, 2003) refer to such an actor as a network administrative organization (NAO) and describe its role as a key determinant of network success. The role of the NAO is to distribute funds and organize the activities of the other entities in the network (2001, p. 418). Moreover, Provan & Milward found that the greater the centralization of a network, the more effective it was in achieving its goals (2001, p. 419). By contracting with so many different organizations, EPC Program I evolved into a network, and its EPC office seems to carry out the tasks of a NAO as described by Provan & Milward (2001, p. 418).

To help conceptualize the role of such a central office using Barringer & Harrison's (2000, pp. 387-89) metaphor of the wheel, AHRQ's EPC office can be viewed as the hub of the wheel, with the organizations with which it contracts as the spokes. As the NAO, AHRQ's EPC office organizes and brokers the activities of other actors with which it contracts, which form the network. The EPC office, as the NAO of Program I, authorized and coordinated the activities of more than 100 different entities that were located throughout the U.S. As the NAO, the EPC office determined and coordinated the following activities of the network:

- Selecting evidence-based topics to fund
- Identifying which EPC would draft evidence reports for one or more of the 93 topics

- Assisting the EPCs in identifying individual members both inside and outside of the Program's network to serve on the expert advisory and peer-review panels
- Granting final approval on expert advisory and peer-review panel members
- Drafting timelines for which the EPC conducts work on each evidence report
- Distributing funds to EPCs for services completed
- Overseeing the EPC contracts and publication of the derivative products produced by the EPCs

These activities were coordinated by the EPC office for each evidence-based topic, which suggested that at least some degree of centralization in the network. If I found evidence of a relatively high centralization, I expected Program I to have been effective, with the EPC office as the NAO that created a centralized network in which the actors operated:

Hypothesis 1: The more centralized network in which the actors of Program I worked, the greater its effectiveness.

At the same time, many organizational theorists, including Mandell (1988, 1990), Milward & Provan (1995, 2001, 2003), and Peters (2001), contend that such networks can be riddled with conflicting organizational goals (e.g., goals in private organizations versus those of non-profit organizations).[23] Individuals in multiple occupations who form multidisciplinary work teams typically are found among the actors in networks that may have conflicting goals and even opposing philosophies. For instance, there may be varying views among network actors that

[23] See for example, Gormley & Balla, 2003, pp. 115-6; Kickert et al. eds. 1997; Mandell, 2001; Milward & Provan, 2003, pp. 8-9; Peters, 1996; Peters & Savoie, 1996, pp. 281, 286; Sydow et al., 1997.

pertain to the types of health services research that are suitable for inclusion in an evidence report or guideline. Some actors might believe that only findings from quantitative studies are suitable to use in an evidence report or guideline and refuse to consider findings from qualitative studies as providing valid or reliable data that should be included; other actors could wish to cite the results from qualitative studies in the evidence report or guideline and have little understanding as to why such studies are not included. Together, multiple occupations, norms, conflicting philosophies, and goals can often lead to fragmentation and network complexity (Agranoff, 2003; Agranoff & McGuire, 2001; Williams, 2002, p. 103).

The network in which the Program operated also appears to have had weak ties connecting its actors (Hansen, 1999, p. 107). For example, most of the individuals from the EPCs (e.g., in teaching hospitals) had not worked regularly on drafting evidence reports and translating the findings into derivative products in conjunction with specific individuals from the partners that nominated the evidence-based topic (e.g., from medical associations, the Centers for Medicare & Medicaid Services).

I expected that the complex network with weak ties connecting the actors in which EPC Program I was embedded would limit its effectiveness. For example, the nature of the network connecting the actors might explain both why in March 2011 AHRQ still did not have a complete record of the number of translations, disseminations, and public accessibility to the products that took place during Program I, and why it does not have records of the nominating partners' or the EPCs' past performance in translating evidence reports or disseminating the derivative products, or of the rates of accessibility to such products (see Chapter One). Arguably, having these kinds of records could have provided valuable information to the Agency and enhanced its ability to make more informed decisions about possible future contracting.

In addition, the EPC Program's contracts seem to have been the only means that the Program had to link the EPCs and the partners. Provan & Milward (1995, 2001, 2003) in their studies of mental health delivery services found that network effectiveness was achieved most often when a strong centralized office provided clear, explicit instruction and timelines for completing tasks for each entity in the network; in such a situation, ties were stronger. Such clarity in tasks between the EPC and partners could have been instrumental in increasing the overall effectiveness of Program I.

Over the past several decades, theorists have differed over the effectiveness of weak versus strong ties connecting network actors (Hansen, 1999, p. 82). Both kinds of ties can be effective, but they may be effective at achieving different goals (1999, p. 83). Weak ties among network actors tend to be most effective when the primary goal is searching for new information (1999, p. 82). Because network actors connected by weak ties have distant relationships with one another and rarely interact, they have a lesser chance of producing redundant information (Granovetter, 1973, p. 1360, pp. 1366-78). Searching for new information within the network uses far fewer resources (e.g., time and money) than looking outside of the network would and thus results in higher levels of effectiveness (Uzzi, 1997, p. 36).

Strong ties (Hansen, 1999, p. 82) among network actors, in contrast, are most effective when the goal of the network centers around transferring complex knowledge (e.g., scientific data) to a relatively small group of actors (e.g., a research and development team) that already are familiar with one another and can further develop the complex knowledge that has been transferred to them by others in the network (Hansen, 1999, p. 83). Because actors within the network are familiar with one another and the information that is being transferred to them, it takes less time to communicate complex knowledge in the network. Thus, when the goal of the

network is to transfer complex knowledge, stronger ties connecting network actors will result in higher levels of effectiveness.

Based on these findings, EPC Program I appears to have confronted a task that required strong ties among the network actors, since the complex knowledge found in the evidence reports needed to be transferred from the EPCs to the partners (the entities that nominated the topic) for translation. Likewise, the transfer of quality improvement tools, educational programs, and reimbursement policies during dissemination also involved forms of complex knowledge. Operating in a network with stronger ties connecting the actors could have increased program effectiveness. This is significant because the EPC Program's contracts did not include work schedules that allowed the EPCs and partners to develop insight into each other's knowledge base; nor did the contracts include time periods during which the EPCs and partners were to work with one another in translating evidence reports.

In such instances, greater amounts of coordination among the entities in the network of EPC Program I might have been required for AHRQ staff members to more clearly communicate tasks, and goals than if the Agency had conducted the work itself (McGuire, 2002, p. 605; Peters & Savoie, 1996, p. 281). The operational complexity of coordinating the activities of these organizations could well have weakened the effectiveness of EPC Program I.

Based on this discussion, I expect:

Hypothesis 2: A complex network in which the EPC Program operated will be associated with lower levels of effectiveness.

Hypothesis 3: Weaker ties among the actors that operated in Program I will be related to lower levels of effectiveness.

**AHRQ's Financial Resources and Hortatory Control**

Another explanatory factor directs attention to AHRQ's financial capacity. The Agency's financial resources are a combination of appropriations that come directly from Congress and allocations from the Public Health Service (PHS). Under PHS Act §241, the Secretary of HHS decides the amount of funds that PHS allocates to the Agency each fiscal year. (A list of AHRQ's total funds and funding sources during EPC Program I appeared in Table 1.)

Gormley probably would view the availability of financial resources as a hortatory mechanism, because Congress and the PHS can use funding as an incentive for the Agency to achieve its goals and as a sanction when it does not. As noted earlier, hortatory control mechanisms include embedded incentives. Congress could have used financial resources as a sanction by threatening to cut off AHRQ's funding by fiscal 2002 if the Agency did not comply with its mandate.

Another key attribute of hortatory control mechanisms is their flexibility. Congress and PHS can use funding as either a more catalytic or a more coercive control. For instance, Congress or PHS could have increased, decreased, or completely eliminated the funds that they allocated to the Agency. If AHRQ did not fully achieve its mandate and Congress or PHS enforced this threat, then funding would have leaned toward being a coercive control. If, however, Congress or PHS threatened to decrease or eliminate the Agency's funding, but did not act on the threat, then the hortatory control would have resembled a catalytic control.

Gormley observes that a hortatory control that leans toward a catalytic mechanism in most instances enhances an agency's effectiveness. He most likely would argue that allowing AHRQ officials the discretion and financial wherewithal to decide when and how to comply with specific portions of the legislative mandate would have increased Program I's effectiveness. If

AHRQ did not have adequate funds due to attempts by Congress or PHS to control it, then this could help explain lower levels of program effectiveness.

As Gormley would advise, available financial resources might have been directly linked to the EPC Program's effectiveness. The Agency's ability to monitor the contractual agreements with the EPCs and nominating partners could have been limited if the Program did not have adequate money to pay for appropriate personnel or travel expenses. Thus, one might predict:

Proposition 2: An increase in the funding in each fiscal year will be associated with greater EPC Program I effectiveness.

**Control that was Available to the Agency**

Next, I extend Gormley's ideas to a different level of analysis and to another factor that also might be useful in explaining AHRQ's effectiveness. A sixth explanatory factor pertains to a mechanism that was available to the Agency's EPC Program to control others. I believe that AHRQ used catalytic controls. Congress mandated that the Agency "support" (rather than manage) the development of evidence-based research and dissemination of the information in the form of quality improvement tools for everyday health care and to make the information "widely accessible" to the public. Congress further mandated that AHRQ support this work within a broad and complex network that included public and private organizations. Allowing the Agency to only "support" and insisting it operate in a network that included public and private entities that were located in geographically diverse regions limited AHRQ's discretion in deciding how to fulfill its mandate. Moreover, mandating that the Agency support these activities limited the type of control that was available to it in carrying out its statute, leaving the Agency primarily with catalytic control over the partnerships (Health Research and Quality Act of 1999).

Catalytic control was available to EPC Program I through using funds as an incentive for nominating partners and EPCs to develop evidence reports and to disseminate and provide accessibility to the derivative products. If a partner or EPC did not comply and the EPC office did not withhold funds to an EPC or did not select a particular partner's topic for funding, then the mechanism would have been a catalytic control. When Program I allocated funds to solve a particular problem (e.g., in this case, an evidence-based topic) but gave limited if any instruction about how to carry out the tasks, then the control strategy could be viewed as a catalytic control mechanism. If the EPC Program office applied catalytic control, partners and EPCs would have had more discretion as to the actions to take in drafting an evidence report and disseminating and providing accessibility to the derivative products. Discretion also may have offered the EPC entities with which the Agency contracted the opportunity to be creative in finding solutions to particular problems, and thus very well could have increased the EPCs' effectiveness. For instance, if AHRQ extended contract deadlines and provided resources such as technical expertise[24] in assisting the nominating partners and EPCs, such a mechanism would have been a catalytic control. Extending contract deadlines and providing technical expertise could have afforded the entities with which the Agency contracted the opportunity to find innovative means for translating evidence reports and disseminating the derivatives; it therefore could have increased the contractors' levels of effectiveness. Further, the extent

[24]AHRQ could have provided technical expertise in the areas of translation and dissemination. In the case of translation, this could have been useful if the partner lacked technical expertise or if the EPC was having difficulty communicating with the partner. However, providing technical expertise might have been futile if the partner did not agree with the findings in the evidence report. If so, the partner might have wished not to translate the evidence report or to disseminate its derivate products. In the case of dissemination, technical expertise might have been useful if the partner found it technically difficult to disseminate the information. However, if the partner had difficulty disseminating the derivate products for financial reasons, providing technical expertise probably would not have been useful.

to which a contractor was effective would most likely be positively related to the Program's effectiveness. Thus:

Proposition 3: The EPC Program's use of catalytic control will be associated with higher levels of program effectiveness.

## Conclusions

Review of relevant theories in the organizational and network management literatures helped build an appropriate conceptual framework for seeking the explanations of effectiveness in Program I. (Table 3 summarizes the propositions and hypotheses to be explored.) Although extensive research has been conducted that examines network formation (Agranoff & McGuire, 2001; Barringer & Harrison, 2000), less is known about how effective government programs are when contracting out work and operating in a broad and complex network of non-governmental entities (Gormley & Balla, 2003; Mandell, 2001; Milward & Provan, 2003; Provan & Milward, 1995, 2001). The next chapter describes the research design used to examine Program I's effectiveness and explore the three propositions and three hypotheses.

# CHAPTER 4

## THE RESEARCH DESIGN

The propositions and hypotheses Chapter Three discussed drove the overarching research design of the study. This chapter describes the specific type of case study inquiry used, the data collection methods, and the approach to data analysis. It also discusses triangulation, issues of validity, and the limitations of the study.

### Case Study Inquiry

Case study inquiry is the focused attention on one or multiple instances of a social phenomenon (Yin, 2003, pp. 13-4). The objects of such inquiry might include a hospital, a ward, or a group of patients in which multiple data sources are used to investigate the phenomenon (Stake, 1998, pp. 86-7). However, not all phenomena meet the criteria for being deemed a "case." There must be similarities in process, behavior, or outcome that form a distinctive boundedness (Creswell, 2003, p. 61). The actors in EPC Program I had many similarities and patterns of behavior that bounded their activities. The most recognizable patterns revolved around the topics selected for Program I.

In order to better describe approaches to case analysis, Stake (1998) identifies three types of inquiry: collective, intrinsic, and instrumental. First, a collective case study involves examination of several different phenomena to provide better understanding of each case and, in some instances, to refine theory (1998, pp. 89-90). An intrinsic case study is not carried out to further theory or to produce generalizations, but rather because a particular phenomenon is of high importance and interest to the researcher or to identifiable groups such as taxpayers (1998, p. 88). An instrumental case study is an analysis of a specific case conducted with the intent of providing insights into similar cases or of refining theory (1998, pp. 88-9). The research here is

an example of an instrumental case study. The exploratory effectiveness analysis of AHRQ's EPC Program I seeks to contribute to more fully understanding both the dynamics and the effects of government when it contracts out its work and operates in a broad and complex network.

## Timeframe

To determine the appropriate period for examining EPC Program I's effectiveness at translation, dissemination, and public accessibility, I first turned to the Agency's authorizing statute. An example from the statute that pertains to time is found in SEC. 916: "(b) SPECIFICATION OF PROCESS. – (1) IN GENERAL.—Not later than December 31, 2000, the Director shall develop and publish a description of the methods used by the Agency and its contractors for health care practice and technology assessments."

Further, many features distinguish the EPC programs from each other. The most notable is time. Each EPC program lasts five years. Program I commenced in 1997 and concluded in 2002. EPC Program II began in 2002 and ran until 2007. Program III commenced in 2007 and will conclude in 2012. My focus is on Program I, since enough time has passed since its completion to permit an initial effectiveness evaluation.[25]

## Dependent Variables: Measuring Goal Achievement

First, this section provides an overview of Program I's goals – measures of the extent of achievement of these goals are the dependent variables of the study. Next, it discusses how each was operationalized. Third, I describe how the data were collected on the dependent variables. Finally, the section discusses how the data on the dependent variables were organized.

[25] No other effectiveness analysis of EPC Program I of this kind has been conducted to date.

## Overview of Program Goals

**Translation.** The Agency's GPRA Strategic Performance Plans ("Performance Plans" hereafter) describe translations as "putting research findings and other information into language that allows it to be understood and used by different audiences."[26] Translation in Program I involved a designated network actor[27] using the report to develop a quality improvement product that could be applied to everyday health care delivery.[28]

As already noted, EPC Program I selected 93 evidence-based topics. AHRQ assigned each topic a number and grouped 74 of the topics into 16 different clinical categories. The 19 remaining topics (nominated by units in HHS) were not placed into a separate clinical category. Table 4 provides a list of EPC Program I's clinical categories and the total number of topics selected in each category.

(Table 4 about here.)

Evidence reports were to be drafted on each of the topics. Each evidence report was scheduled to be translated into a quality improvement tool (product) such as a clinical practice guideline, education program, or a reimbursement policy by the end of 2002 (i.e., as EPC Program II commenced). As will be seen, however, in some instances it took several years to generate an evidence report for a selected topic and nearly five years to translate the report into a product.

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[26] The GPRA Performance Plans and the GPRA Performance Reports do not provide specific measures of the translation of evidence reports from EPC Program I, most probably because it is just one program of many in the Agency. AHRQ's GPRA office might not have had the resources to have detailed and comprehensive measures for each program in the Agency. Neither do the GPRA Performance Plans or the Performance Reports indicate the amounts of time that the partners from EPC Program I took to translate the EPC evidence reports. (*Fiscal Year 2000 Performance Plan and Performance Report; Fiscal Year 2000 Performance Plan and Performance Report; Fiscal Year 2002 Performance Plan and Performance Report.*)

[27] Either the EPC that drafted the evidence report or the partner organization(s) summarized the scientific data found in an evidence report that it nominated as an evidence-based topic; then used the summary to draft quality improvement tool (clinical practice guideline, educational program, or reimbursement policy) for everyday health care delivery; and cited the evidence report as the source for at least part of the tool.

[28] An example of citing a source in the translation of an evidence report might be as follows: "On August 1999," we (e.g., the American Association for Pain Management) "translated Duke University's report on the treatment of lower pack pain… the findings of the report support that … This report was drafted for AHRQ by Duke University on June, 1998."

I considered an evidence report to have been translated when I found documentation that listed the date of translation and the organization(s) that translated it. In every case, information about the date of translation of an evidence report was found when the derivative product of the evidence report was found.[29] I used the same data sources (detailed below) to determine the extent of translation, dissemination, and accessibility.

**Dissemination.** As articulated in the Agency's GPRA reports, dissemination is "the process by which knowledge and information are conveyed to external audiences."[30] Dissemination of quality improvement tools, programs, or policies occurs when these products are made "widely available" to consumers, educators, healthcare practitioners and providers, patients, and policymakers.[31] The term "widely available" is not defined in the authorizing legislation, in AHRQ's GPRA Performance Plans or in the GPRA Performance Reports. Here, I interpreted "widely available" as meaning that a tool, program, policy, or article that was derived from an EPC Program evidence report was posted on a major healthcare website or database. Actual use of a particular tool, program, or policy by the public was not a requirement for dissemination to have taken place. In EPC Program I, no fewer than 93 tools, programs, or policies should have been made widely available to consumers, healthcare practitioners and providers, patients, and policymakers.

[29] Thus, translation and dissemination were not empirically distinguishable; they are, however, analytically distinct.
[30] *Fiscal Year 2000 Performance Plan and Performance Report; Fiscal Year 2000 Performance Plan and Performance Report; Fiscal Year 2002 Performance Plan and Performance Report.* I collected the total number of "hits" on major databases (e.g., the National Library of Medicine, the National Guideline Clearinghouse) and the number of total downloads of AHRQ products on the databases as indicators of dissemination, but did not distinguish which products from the Agency were available on these websites or which products were downloaded. Many programs at AHRQ develop products that are posted on websites. This means that the total number of hits and downloads from the databases may not have involved derivates of EPC Program I's evidence reports (*Fiscal Year 2000 Performance Plan; Fiscal Year 2001 Performance Plan; Fiscal Year 2002 Performance Plan*).
[31] AHRQ's GPRA Performance Reports and I collected the total number of "hits" on major databases (e.g., the National Library of Medicine, the National Guideline Clearinghouse)

**Accessibility.** Determining when and which members of the public actually had access to these products is relatively complicated, since so many different entities can be involved in dissemination. For instance, it is the responsibility of each of the nominating partners to disseminate the derivative product to its members and affiliates (AHRQ, 2000, 2005, 2010, 2011).[32] Here, indicators that parts of the public had access to any of the tools, policies, or programs included the appearance of these products on major healthcare databases, on EPCs' and partners' websites, or in medical journals[33]; the number of "clicks" that it took to access the relevant tool, program, or policy on each of the databases or in medical journals; and whether the database provided links for particular groups (e.g., "for patients" or "for health care practitioners").

## Operationalization of the Dependent Variables

The effectiveness of EPC Program I in translation, dissemination, and accessibility was tapped in various ways. Among the indicators of overall effectiveness were the total number of evidence reports translated and derivative products disseminated, the proportions of evidence reports translated and products disseminated in each category of disease or service, and the overall accessibility of evidence reports and products in each clinical category.

**Translation effectiveness**. The total number and proportions of evidence report translations (e.g., articles, guidelines, reimbursement policies) in each clinical category that were

[32] See http://www.ahrq.gov/epcprogram/.

[33] I gathered data on the tools, programs, and policies from EPC Program I that had been published (i.e., disseminated) in peer-reviewed medical journals. These data were compiled in the Agency's "Impact and Publication Report" (November 12, 2003). In the report, nearly half of the derivate products from EPC Program I were listed as having been published in peer-reviewed medical journals. Although these data were helpful, they were incomplete. Pertinent information for this study (such as the month and year of the publication, where the article referenced the work of the evidence report, the keyword search term, the degree of public accessibility to the product, and relevant web addresses) was not included. As a result, I conducted searches for articles mentioned in the report. Staff members at the GPRA office also gathered data from magazines, newspapers, and non-peer-reviewed journals. However, such data can be problematic for a study such as this, since the specific references that were used to develop tools, programs, and policies often were omitted. These references were needed to identify which of AHRQ's programs was responsible for supporting the development of such derivative products.

translated into products tapped translation effectiveness: more, and greater proportions of evidence report translations in a clinical category suggested higher effectiveness. The amount of time in months that it took from the date the evidence report was completed to the date the derivative product was published also was measured: the fewer number of months between the date an evidence report was released to the date it was translated, the greater the effectiveness.

**Dissemination effectiveness**. The total number of websites and databases with links to the derivate products, and the total number of and proportion of links to the products for each clinical category measured dissemination effectiveness: higher numbers and proportions of websites with links to the derivate products, and more links to products on those websites indicated higher levels of effectiveness.

**Accessibility effectiveness**. The total number and proportion of evidence reports and derivative products that were available to all members of the general public and the percentage of the evidence reports that was accessible only to some members of the public (e.g., to, subscribers to peer-reviewed medical journals) in each clinical category tapped accessibility effectiveness: more of the public having access to the evidence reports and products suggested higher effectiveness. The number of steps (or "clicks") needed to access a product also was counted: fewer clicks needed to access a product indicated a higher degree of effectiveness. In addition, the numbers of websites and databases that provided links for specific groups were counted: the more sites with such links, the greater the effectiveness.

## Collecting Data on the Dependent Variables

Figure Four shows the sources for collecting data on the dependent variables and how each was used in the study. I developed three general protocols for obtaining data on the

(Figure 4 about here.)

dependent variables in a rigorous and systematic manner. Since a common protocol for determining the organization(s) from which an evidence-based output originated has not yet been established for evaluations such as this, I created a set of protocols for conducting searches and verifying data. To help ensure the validity and reliability of the data collected with these methods, I reviewed each protocol with Caryn McManus, a medical librarian, whose specialty is in evidence-based medicine. McManus[34] approved of both the validity and reliability of each protocol developed. Appendix D contains the three protocols: one for determining where an evidence report originated, another to verify where a derivative product originated, and the third to determine the degree to which an evidence report or derivative product was accessible to the public.

Then, keyword searches were conducted on each identified website, database, and electronic peer-reviewed journal.[35] Keywords included the name of the EPC that drafted the evidence report, the name(s) of the partner organization(s), and the title of the selected evidence-based topic. This search strategy was carried out for each of the 93 evidence reports. Depending on factors like the evidence-based topic itself and the website, database, or electronic peer-reviewed journal, such keyword searches at times yielded numerous results on a related topic that in many cases originated from an entirely different source than the Agency's EPC Program. For example, a clinical topic such as management of arterial fibrillation typically was written about in many places, not just in an AHRQ-supported EPC evidence report or derivate product, and it therefore could have appeared in sources other than the EPC Program, such as in a review

[34] Additionally, I reviewed my search results and the manner in which I organized the evidence report and derivative product data. McManus also approved of my methods in each instance and commended me on what she and many others who work at AHRQ have termed "labor-intensive data collection."

[35] Each peer-reviewed journal identified was published in both print and electronic form. In addition, more than 65% of the partners supported at least one peer-reviewed medical journal. A link from a partner's website that sponsored a medical journal typically appeared on the partner's home page. However, a member of the public must subscribe to the journal in order to access the contents from the partner's website.

by the Cochrane Collaboration; thus I did not count it as an output of Program I. It was particularly important in terms of accuracy, first, to verify whether the evidence report or derivative product was actually an output of EPC Program I, and second, to identify whether the designated Program I, partner or EPC actually translated the evidence report and disseminated the derivative product.[36]

To gain insight into the extent of Program I's translation, dissemination, and accessibility effectiveness, analysis of the data collected on the dependent variables was conducted simultaneously by reviewing, keying in, and organizing the information yielded by two data sources into one general master data file where the level of analysis was the EPC Program I network.

**Collecting data from the websites and databases.** I reviewed evidence reports and derivative products on a total of 156 websites (including those of 143 partners, 12 EPCs and AHRQ) and five national health care databases. To identify how many evidence reports were translated into derivative products, how many were disseminated, and the degrees of public accessibility, however, I first needed to know how many of the 93 evidence-based topics had been drafted into evidence reports. To determine this, I turned to the Agency's website, which had evidence reports available both online and in paper form. Using AHRQ's work documents on the evidence-based topics selected for Program I, I reviewed each accessible evidence report both online and in paper form to verify the date it had been selected for funding, the

[36] If an organization other than a Program I EPC or partner drafted an evidence report, translated it into a derivative product, or disseminated and provided some degree of accessibility to the product, regardless of how similar it was to an EPC Program I evidence report or derivative product, it still was excluded as an output from Program I. It should be reiterated that this is an effectiveness evaluation of the outputs from EPC Program I, not an effectiveness evaluation of the outcome of Program I products, or what is commonly referred to in the health policy arena as the "spread" or adoption of a product.

organization(s) that nominated the evidence-based topic, and the EPC that was assigned to draft the evidence-based topic into the evidence report.

While I entered relevant data about each identified Program I evidence report and derivative product into the data file, I also continuously calculated, for each clinical category, the total number of evidence reports translated and derivative products disseminated, the proportions of evidence reports translated and products disseminated, and the degree of overall accessibility of the evidence reports and products. As I was collecting, reviewing, and summarizing these data, an initial pattern emerged: more than half of the partners supported at least one peer-reviewed medical journal. In most instances, a link to the journal was available from the partner's website. Identifying this led to my adding peer-reviewed medical journals as the third data source for the dependent variables. Forty-seven peer-reviewed medical journals were identified from the partners' websites and the major health care databases.

**Organizing Data on the Dependent Variables**

Next, to organize information gathered on the dependent variables, I built a database that contained the indicators of Program I's translation, dissemination, and accessibility effectiveness. Included, for example, were the amounts of time (in months) that it took to translate each of the evidence reports and the overall accessibility of each derivative product the partners' and EPCs' websites and in major healthcare databases and peer-reviewed journals. In this data file, I used the same 16 clinical categories (i.e., disease, condition, and health services) to group each of the 74 evidence reports, with the remaining 19 topics placed in another category. Retaining these distinctions permitted me to analyze and compare any variations among clinical categories in, for example, the length of time taken to translate evidence reports and to disseminate the derivatives,

and the total number of evidence reports translated and derivatives disseminated. The data collected also included:

- The date that AHRQ published an evidence report
- Whether the evidence report was translated
- Whether the derivates were disseminated
- The name(s)[37] of the partner(s) and EPCs that translated the evidence report
- Whether the evidence report was translated into a tool (e.g., clinical practice guideline, reimbursement policy) or peer-reviewed article
- Whether the translated evidence report and disseminated derivate were published in a medical journal (and if so, which one)
- The relevant web addresses of each major database[38]

[37] In many instances, there was more than one partner. I recorded each partner for evidence reports in my database.

[38] Since this is the first time a study of this nature has been conducted, the data needed had not been collected. In building my database, I included spaces to record whether an evidence report had been translated; entries indicated either (1) "yes," and included (a) the date the evidence report was translated, (b) the document on the website (the work product) that provided the date of translation, and (c) the date and the address of the website where the information was found; (2) "no," if I was unable to find any documentation that the evidence report had been or is going to be the translated as well as the date of the search and the websites visited; or (3) the date that the evidence report was expected to be translated, (a) the date and document that provided this information and (b) the website address and the date the information was retrieved. When recording whether the derivate products had been disseminated, each keyword search was noted, as was which search was successful in accessing the tool, program, or policy for each database. In determining the overall accessibility of a tool or peer-reviewed article, I counted the number of links or "clicks" that it took to access the relevant derivative product on each related health care database and website (e.g., medical journal). I also noted whether the database or website provided links for particular groups (e.g., "for patients" or "for health care practitioners"); if there were links, I noted which groups had them. For the major health care databases that provided designated links, I logged the number of clicks it took to access the tool or article from the starting point of each link. I did this for each database and website for the 74 different evidence reports across each clinical category and for the 19 topics that AHRQ did not group in a clinical category. Using these categories, I began the analysis with the 1997 list of evidence reports and worked forward to 1998, 1999, 2000, and 2001. I searched for an evidence report *translation* (derivative product: tool or article), *dissemination* of the derivate product, and public *access* to the product in the order that AHRQ selected an evidence-based topic for Program I, because the data found in an evidence report become obsolete within five years of the report's publication unless they either are verified as remaining relevant or the data have been revised. (See the American Medical Association, the American Association of Health Plans, and AHRQ's "Inclusion Criteria" on the National Guideline Clearinghouse website at <www.guideline.gov> or on AHRQ's website at <www.ahrq.gov>. )

- The number of clicks that it took to access the relevant tool or peer-reviewed article on each of the databases or in medical journals
- Whether the website or database provided links for particular groups
- Which groups had links

From this data file, patterns and trends by data source were identified. Matrices were created to better aid in organizing the information for analysis. Here, the level of analysis moved from the network to the organization, and to some extent the data in the matrices were organized around sub-categories of websites (e.g., from the EPC Program I network to AHRQ, the EPC, or the partner). In the matrices, the rows contained the title of the topic and the topic's clinical category. The columns contained data including:

- Date a topic was selected
- Date the evidence report was completed
- Citation of each derivative product of the topic that was authored by the EPC
- Number of months an EPC took between completion of the evidence report to translation and dissemination of the derivative product
- Number of partners for the topic
- Partner name
- Partner sector
- Citation of each derivative product that was authored by each partner for the topic
- Number of months a partner took between completion of the evidence report to translation and dissemination of the derivative product

Organizing the data in these matrices aided in exploring and identifying patterns and trends in the effectiveness of EPC Program I (Creswell, 2003; Miles & Huberman, 1994, pp. 93-96; Yin, 2003).

In sum, during this iterative process of collecting and organizing the data, I employed an Excel data file and matrices to introduce, organize, code, and categorize the data as Creswell (2003) suggests. I then used these categories to make descriptive inferences including identification of trends, patterns, and differences among translation, dissemination, and accessibility effectiveness (King, Keohane & Verba, 1994; Krippendorf, 2004; Marshall & Rossman, 1999).

## Independent Variables

As Chapter Three discussed, Gormley's ideas about government effectiveness and other relevant views from the organizational and network management literatures may help explain why Program I was as effective as it was. From this discussion, six explanatory factors were identified. This section examines the indicators and data sources used to measure those factors.

### Operationalization of the Independent Variables

**Extent of coercive congressional control over AHRQ.** Such control was measured by the number of compulsory deadlines in the authorizing statute: fewer specific deadlines indicated lower levels of coercive control over the Agency. Data sources employed to measure the extent of congressional control were the Agency's statute and interview responses.

To measure the five remaining independent variables, in most instances I examined both quantitative and qualitative data. Figure 5 provides an overview of the indicators and data sources used to tap each of the five variables.

(Figure 5 about here.)

Along with EPC Program I work documents and derivative products, I gathered quantitative and qualitative information from the archive of one of the 12 EPCs, here labeled "J."[39] This archive included the EPC's contracts with AHRQ; schedules of work for the EPC that were drafted by the Agency's EPC Office; the minutes from teleconferences for each evidence report that the EPC developed; the EPC's correspondence with AHRQ's EPC Office, partners, advisory and peer-review panel members[40]; and correspondence from the Agency's EPC Office to the 12 EPCs that pertained to policies, procedures, and work progress. After these data from the EPC's archive were collected and analyzed, I gathered additional qualitative data by administering a telephone questionnaire to top-level administrators and research scientists at the EPCs. To protect the anonymity of each EPC entity whose staff served as a key informant, I randomly assigned an alphabetical letter to represent each.[41]

**Network centralization.** The degree of network centralization was measured using two indicators. First was the extent to which Program I work activities were coordinated[42] by AHRQ's EPC program office: lower numbers of activities coordinated by the EPC office in the network indicated lower levels of centralization. The work activities included:

[39] In accordance with the signed anonymity and confidentiality agreement I entered into with the EPC that provided access to its archives from Program I, its name will remain anonymous in the dissertation. Instead the EPC is represented by an alphabetical letter that I randomly assigned to it.

[40] The EPC J archive included the EPC's correspondence with AHRQ's EPC office, partners, advisory and peer-review panel members for each evidence report that the EPC was contracted to draft and to assist the partners in translating each into a derivative product.

[41] With two bowls, one labeled "Organizations" and the other labeled "Letters 'A' to 'Z'," I wrote the name of each network entity on separate pieces of paper and placed them into the bowl labeled Organization. Next I wrote letters "A" to "Z" on separate slips of paper and placed them into the bowl labeled Letters "A" to "Z." One at a time, I drew a name from the Organization bowl and another from the alphabetical letter bowl, alternating between the two until an alphabetical letter had been drawn to represent each organization whose staff had served as an interview participant. At the same time, I recorded the letter drawn for each entity in a matrix. Following IRB protocol, the only other person who has a copy of this matrix is the dissertation committee chair. Also, in order to follow IRB protocol, after the dissertation is successfully defended this matrix will be destroyed so that the identity of each organization and its staff will remain anonymous.

[42] The term "coordinate" used in this context means to bring together and assign network actors a given task such as drafting an evidence report, translating it into a derivative product, and disseminating the derivative product.

- Coordinate which organizations would work with the EPC Program as a partner (i.e., based on the organizations evidence-based topics that was selected to receive technical and financial resource through Program I)
- Distribute RFPs to each of the 12 EPCs to work on selected evidence-based topics
- Assign task orders to a given EPC to carry out the work for a selected evidence-based topic
- Assign a fulltime AHRQ staff member as a task order officer to oversee an EPC's and partners work in development a given evidence report, an EPC's translation[43] of the evidence report, and an EPC's dissemination of the derivative product
- Distribute the names of journal symposiums and contact information to each of the 12 EPCs for possible paper publication (i.e., dissemination of derivative products)
- Distribute information about AHRQ's EPC Directors' conference and EPC conferences to the 12 EPCs

A second measure of network centralization was the degree to which the EPC Program

[43] The AHRQ task order officer did not oversee the work of partners in translating the evidence report into a derivative product or in disseminating a derivative product. There was not a legally binding contract between the partners and AHRQ about the work and contract deliverables.

office directly distributed money to EPC contractors[44] for services rendered: the greater the number of times that the Program office distributed funds to EPC contractors for services rendered, the higher the degree of centralization. Data sources used to tap centralization were published evidence reports, clinical practice guidelines, educational programs, peer-reviewed journal articles, policy coverage decisions, Program I work documents, interviews, and EPC J archive records.

**Network complexity**. Six indicators measured the extent of network complexity. First was the number of partners for each topic: more partners working on one evidence report suggested higher levels of network complexity. Since the data set is rather small, with considerable variation across the selected topics in the number of partners, I categorized topics with one partner as having "less complexity" and topics with two or more as "more complexity" (see Tables 5 and 6). A second indicator was the number of regions in which the actors

(Table 5 about here.)

(Table 6 about here.)

developing an evidence report were located (see Table 7). Topics with one region are categorized as less complex and topics with two or more as more complex (see Table 8). Relevant actors included the EPC, the partner(s), AHRQ's Program office, and the EPC collaborative component or parts of it: the involvement of actors in more regions suggested higher levels of network

[44] The partners were not paid directly for the work they did in translating an evidence report or disseminating the derivative product. Instead, the evidence-based topic that the organization, and soon to be partner, nominated was selected for funding. Each topic cost about $250,000 to fund. However, in order for the topic to be selected for funding, the topic had to meet the EPC Program's criteria (*severity* of a disease or condition, frequency of a disease or condition, and *cost* of a disease or condition to the U.S. population) as discussed in Chapter Two. Also, whether EPC Program I selected a topic that was nominated by an organization was contingent on whether the organization agreed in writing when it nominated the topic to translate the evidence-based report once it was completed and to disseminate the derivative product. In addition, the organization that nominated a topic was required by EPC Program I to specify its technical expertise in translating a presumably forthcoming evidence report on the topic into a derivative product and to disseminate it to its membership or affiliates.

complexity. I classified actors that were in a 50 mile radius of the EPC that was contracted to draft an evidence report as being in the same region. Any actors located outside of the 50 mile radius were categorized as being in another region.[45] Data sources used to measure this

(Table 7 about here.)

(Table 8 about here.)

dimension of network complexity were published evidence reports, clinical practice guidelines, educational programs, peer-reviewed journal articles, policy coverage decisions, Program I work documents, interviews, and EPC J archival records.

Third, complexity of the network was measured by the degree of sector (i.e., public or private) homogeneity of the actors working on an evidence report: higher levels of sector homogeneity among the actors that worked on a single evidence report indicated lower levels of network complexity. I categorized topics with one sector as having "less complexity" and topics with two sectors "more complexity" (see Table 9).

(Table 9 about here.)

A fourth indicator of network complexity was the combined EPC, partner, and Program Office levels of operation (i.e., local, state, and national): the greater the number of operational levels of actors working on one evidence report, the higher the degree of network complexity. Due to the relatively small data set with variation across the selected topics in the number of

[45] Actors included in the 50 mile radius from the EPC were those that were assigned to work with the EPC on a given evidence-based topic. The U.S. Department of Transportation states in its *National Transportation Statistics* 1999 to 2005 that "long-distance" travel is 50 miles or more (U.S. Department of Transportation 1999, 2000, 2001, 2002, 2003, 2004, 2005). Using this as a criterion, I categorized any actor located within a 50 mile radius of the EPC as being in the same region. The rationale for the EPC to serve as the center of the 50 mile radius for each evidence-based topic was that the EPCs were the only actors that were formally contracted by Program I to draft evidence reports and then to assist the partners in translating the findings into derivative products. Because of the formal contract with AHRQ, the EPCs were the only actors in the network, other than AHRQ staff members, that were scheduled to receive monetary compensation from EPC Program I for services rendered. As a result, I expected the EPCs to conduct more work than the other actors in achieving Program I's goals and that the efforts to draft specific evidence reports and to translate each into derivative products would center around the EPCs. Actors that were not in a 50 mile radius of the EPC but were in a 50 mile radius from one another were categorized as being in the same region.

levels (see Table 10), I categorized topics with one level as less complexity and topics with two or more as more complex (see Table 11). Data sources employed to tap this indicator of network

(Table 10 about here.)

(Table 11 about here.)

complexity were published evidence reports, clinical practice guidelines, educational programs, peer-reviewed journal articles, policy coverage decisions, Program I work documents, interviews, and EPC J archive records.

Fifth was an EPC's "collaborative component."[46] The more often an EPC employed its entire collaborative component to work on an evidence report and translate it into a derivative product, the higher the level of network complexity. Data sources employed to measure an EPC's collaborative component were published evidence reports, clinical practice guidelines, educational programs, peer-reviewed journal articles, policy coverage decisions, Program I work documents, interviews, and EPC J archival records.

Finally, the sixth indicator of network complexity was the number of advisory and peer-review panel members for each evidence report. Such panels generally consisted of eight to ten individuals, with members who came from a wide variety of organizations including hospitals, laboratories, managed care, medical associations and societies, and federal agencies[47]; the greater the number of panel members, the higher the level of network complexity. Data sources used to tap this dimension of network complexity were interviews and EPC J archive records.

[46] The term "collaborative component" was the language that AHRQ used in its "EPC profile" work document. The Agency developed a profile for each EPC. The profile provided facts about the EPC such as the EPC's staff members and areas of medical expertise. It also included the EPC's collaborative component. The EPC collaborative component was comprised of various clinics, hospitals, and health policy organizations that each EPC identified at the outset of Program I as being available to work with the EPC on an evidence report when the EPC thought additional expertise was needed.

**Tie Strength.** The strength of ties was measured by the number of times an author in Program I referenced or quoted another EPC's or partner's work that was a Program I derivative product: the more times authors in the network referenced another EPC's or partner's work, the stronger the ties among the actors within Program I's network. Data sources employed to tap this indicator were published evidence reports, clinical practice guidelines, educational programs, peer-reviewed journal articles, policy coverage decisions, interviews, and archival records.

A second indicator of tie strength was the extent of the actors' familiarity with the methodology of EBM. The EPC Program used EBM methodology to draft evidence reports. If the actors of Program I were not familiar with it, this could have served as an impediment to drafting evidence reports and translating the findings into derivative products and thereby might have been associated with the degree of effectiveness. The greater the number of entities that were familiar with EBM methodology in Program I, the greater the tie strength among the network actors. Data sources employed to tap the values of this indicator and the remaining measures of strength of ties were interviews and archival records.

Third, varying philosophical orientations (i.e., systems of thought for treatment of a specific disease or condition) among the partners, members of the advisory and peer-review panels, and the EPC working on an evidence report or derivative product served as an indicator of tie strength: fewer variations in philosophical orientation suggested stronger ties.

The number of times staff members from an EPC spoke with individual representatives of partner organizations at a medical association or society conference during Program I also was

[47] A patient advocate (from, for example, the Consumer Coalition for Quality Health Care) was supposed to serve as an advisory panel member for the topics selected during Program I. However, at the outset of EPC Program I, program actors (including EPC staff members and individual partner representatives) maintained that including a patient advocate on the advisory panel would lead to unnecessary complication in generating the evidence report, translating the report, and disseminating and providing access to the translation. As a result the EPC Program omitted including patient advocates on the evidence-based topic advisory panels (Background Information, 2005).

employed to measure strength of ties: the more frequently EPC staff members spoke with a partner at such meetings, the stronger the ties among the network actors. A fifth indicator was the number of times staff members from an EPC talked with individual representatives of another EPC at a medical association or society conference during Program I: the more frequently EPC staff members talked with staff from other EPCs at these meetings, the greater the strength of ties. Similarly, the number of times EPC staff members talked with individuals from other EPCs at AHRQ's EPC Directors' and EPC conferences during Program I served as a sixth measure of the strength of ties: the more frequently EPC members talked with other EPC staff members at AHRQ's EPC Directors' and EPC conferences, the stronger the ties among the actors that operated in Program I.

Finally, the seventh indicator, the number of times EPC staff members talked with individual representatives from other EPCs or partners at a medical association or society conference prior to the inception of Program I, tapped the strength of ties before EPC Program I commenced. The rationale underpinning this indicator is that if stronger ties in communication existed among the actors prior to Program I, it very well could have remained strong during Program I. The more frequently EPC staff reported talking with either other EPC or partner individuals prior to Program I, the stronger the ties among the network actors.

**Funding.** The change in AHRQ's funding was tapped by increases; decreases, or lack of change in the Agency's funding in each year of Program I, including the amount of funds from congressional appropriations and from PHS. Data sources used to measure the changes in AHRQ's funding were the Agency's annual *Submission for Congressional Budget Justification* (1997, 1998, 1999), AHRQ's *Performance Budget Submission for Congressional Justification* (2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011), *AHRQ's*

*Appropriation History: Fiscal Years 1997 to 2006*, work document, *HHS Budget for Appropriations Committees, Fiscal Years 1994 to 2010,* for AHRQ, and statements from interview respondents.

**The nature of control used by EPC Program I**. The type of control Program I employed in its relationships with network actors was measured using three indicators. Tapping the nature of control the Program applied began by examining the number of times the EPC office drafted a schedule of work for each evidence-based topic: the less frequently the Program office drafted such schedules, the higher the degree of catalytic control that was used by EPC Program I.

The second measure was the number of times AHRQ's EPC office monitored each EPC contract deadline: the more often the Program office monitored each EPC contract, the lower the level of catalytic control that Program I used. Instead such use of this mechanism would suggest a higher degree of coercive control (monitoring the schedule of work was attached to the contract; if deadlines for the contract deliverables were not met then the EPC office could withhold money). The data sources used to tap these two indicators included EPC contracts, task orders, reports from interview participants, and EPC J archive records.

Finally, the degree of catalytic control was measured by the total number of times a network actor was required to correspond with the EPC Program office before it was allowed to conduct further Program I activities. Program I actors included EPCs, partners, and members of the advisory and peer-review panels for each evidence-based topic: the fewer times specific groups of actors in the network were required to correspond with the EPC Program office about work-related activities prior to carrying out other work, the higher the degree of catalytic control that was used by EPC Program I. The number of required contacts by these actors with the EPC

office was counted and the total for each group of actors compared. Data sources employed to measure this dimension included AHRQ's authorizing legislation; the Agency's contracts with EPCs and contractual agreements with partners; publicly accessible Program I documents and work documents; evidence reports, clinical practice guidelines, educational programs, peer-reviewed journal articles, and policy coverage decisions; the statements of interview respondents; and EPC J archive records.

## Collecting Data on the Independent Variables

Figure 6 summarizes how the sources used to collect data on the independent variables were used.

(Figure 6 about here.)

**AHRQ's statute.** The Agency's authorizing legislation was obtained on the LexisNexis Congressional database through a "public law, basic search," using the search term "Healthcare Research and Quality Act of 1999."

However, not all data for this study were so readily available. I provided an anonymity and confidentiality statement to the individuals and organizations from which I collected information for many of the remaining data sources, such as interview respondents,[48] the "Topics Nominated: 1997 to 2001" work document, and EPC J's archival records. (See a copy of the anonymity and confidentiality agreement in Appendix E.)

**Work documents.** Although AHRQ's annual budget justifications were available on the Agency's website, the remaining work documents were gathered by contacting top-level administrators and research scientists by e-mail and telephone to request such material. The

[48] My method for contacting prospective respondents for an interview entailed sending a letter on Center for Public Administration and Policy letterhead. In each letter, I requested an interview and described my research project, the estimated length of the interview, my telephone number and e-mail address, along with my dissertation committee chair's name and contact information. I also included how the information would be reported in the dissertation and in any future publications (Aberbach & Rockman, 2002, p. 674).

documents gathered included AHRQ's annual budget justifications, Budget: Fiscal Years 1996 to 2010, Topics Nominated: 1997 to 2001,[49] and Selected Topics: 1997 to 2001.

**Elite interviews.** Interview respondents were gathered from nine semi-structured interviews (six in-person and three on the telephone) and from seven different telephone questionnaires. The interviews lasted 50 to 120 minutes each and the telephone questionnaire 40 to 50 minutes for each participant. My goal in conducting the interviews and the telephone questionnaire was to gain further insight into why EPC Program I was as effective as it was. Statements from the respondents allowed me to explore and to informally test the hypotheses about the factors that might have been associated with EPC Program I's effectiveness. In what follows, I first discuss how data from the semi-structured interviews were gathered and then examine how information from the telephone questionnaire was collected.

***1. Semi-structured interviews.*** To gather data from prospective respondents, I first constructed a sampling frame of top-level administrators and research scientists who operated in EPC Program I (Aberbach & Rockman, 2002, p. 673). The sampling from this frame was purposive. Each respondent was selected on the basis of what he or she knew. The interview respondents were selected due to their substantive knowledge that could help supplement information that I had already gathered (Aberbach & Rockman, 2002, p. 673). These participants were chosen in an effort to utilize information from well-informed individuals (Witkin & Alschuld, 1995). The interview participants were senior level administrators and research scientists who were chosen based on what they knew about the study's subject matter (Aberbach

[49] I acquired a copy of the "Topics Nominated: 1997 to 2001" Program I work document with an anonymity and confidentiality agreement. However, the document most likely could have been obtained by submitting a Freedom of Information Act (FOIA) request to the Agency. Due to the length of time it takes to process such requests, I chose to ask for a copy of the document through other means, as I was advised by dissertation committee members.

& Rockman, 2002, p. 673; Witkin & Alschuld, 1995, p. 29). In selecting the actual respondents, I relied mostly on personal contacts and referrals (i.e., snowballing).

For the interviews, I drafted and employed a set of open-ended questions[50] for an interview guide that permitted the respondents to engage in discussions that suggested possible reasons about why Program I was as effective as it was (Aberbach & Rockman, 2002, p. 674). (See Appendix F for Institutional Review Board [IRB] approval forms and the interview discussion guide that the IRB approved.) The interviews were conducted in person when possible, or, if not, on the telephone; the choice depended on the distance between the respondents and me. (For example, interviews with participants on the east coast were conducted in person, while those with respondents located in the midwest, on the west coast, or in Canada were conducted by telephone.)

Once the statements from the interviewees were collected, I identified a pattern of responses and gaps in the data and drafted a telephone questionnaire to assist in verifying and supplementing those data. Moreover, by conducting the interviews, I was able to further refine my discussion guide, which aided in developing the telephone questionnaire.

***2. Telephone questionnaire.*** The telephone questionnaire (see Appendix G) was administered to seven separate top-level administrators and scientists at EPCs in Program I. Potential respondents from each of the 12 EPCs were solicited to participate in the study by telephone and e-mail. This questionnaire along with an anonymity and confidentiality agreement was sent to the participants in advance, and, like the interviews, consisted of a distinct set of open-ended questions (Leech, 2002, p. 668). Statements gathered from the telephone

[50] The set of questions that I drafted for the interviews did not lead or limit the interview respondents to provide "yes" or "no" answers. Also, the set of questions that I drafted for the interviews did not provide a list of pre-determined options for the respondent to choose from to use as his or her answer to the question.

questionnaire also were used to cross-reference and verify information collected from other data sources.

**Archival records from EPC J**. I used archival data from EPC J to supplement the data when needed. Data collected from the archive included each year of Program I and consisted of the following:

- The EPC's contract with AHRQ
- Schedules of work for the EPC that was drafted by the Agency's EPC Program Office
- The minutes from teleconferences for each evidence report that the EPC developed
- The EPC's correspondence with AHRQ's EPC Program Office, partners, advisory and peer-review panel members for all evidence reports that the EPC was contracted to draft and to assist the partners in translating each into a derivative product
- Correspondence from the Agency's EPC Office to the 12 EPCs that pertained to selected topics, policies and procedures; and
- Prospective journals for the EPCs to submit evidence report related articles for publication

## Organizing the Data on the Independent Variables

To organize these data, I developed multiple matrices that included the study's independent variables. Listing these factors in the top portion of each matrix allowed me to analyze and compare relevant data. The matrices also contained numerous indicators.

Additionally, I employed the same language used by the data sources in an effort to guarantee that I did not misinterpret the meaning of a word or term.

## Data Analysis

This section first provides an overview of the methods used to analyze the data. Second, it describes the specific approach to data analysis for the dependent variables and, third, the approach to informally testing possible explanations of Program I's effectiveness.

The primary methods used to analyze the data and to examine possible explanations of effectiveness were descriptive statistics and textual analysis. Descriptive statistics summarized the quantitative data, and textual analysis focused on work documents and statements given by interview participants. Descriptive statistics were used primarily to summarize numeric data on Program I's effectiveness in achieving its goals – the dissertation's dependent variables. Textual analysis was employed mainly to tap the study's independent factors. Throughout the study, the unit of analysis remained the evidence-based topic (King et al., 1994; Krippendorf, 2004). Moreover, throughout the process, I triangulated information from a multitude of identified data sources that related to the degree to which EPC Program was effective and why it was as effective as it was.

### Analysis of Program I Effectiveness

After obtaining translation, dissemination, and public accessibility effectiveness data for each of the selected 93 topics, I calculated the means and proportions of translated evidence reports, disseminated derivative products, and levels of public access (full, partial, or none) to the evidence reports and derivative products across each clinical category and year of EPC Program I. Graphical analysis and contingency tables were used to further analyze the trends and patterns that emerged from the data about the effectiveness of Program I.

### Examining Possible Explanations of Effectiveness

To examine why EPC Program I was as effective as it was, I returned to the propositions and hypotheses. To explore the possible relationship between the extent of *coercive control* and Program I effectiveness, I analyzed each compulsory deadline in AHRQ's statute, which of those deadlines had been complied with, what if any coercive action had been taken by Congress or PHS including financial sanctions, and compared these with Program I's effectiveness. I used pattern matching and contingency tables for the analysis.

Informally testing the relationships between effectiveness and network centralization, network complexity, strength of ties, AHRQ's annual funding, and the nature of control used by EPC Program I consisted of analyzing Program I output (i.e., evidence reports and derivative products) using work documents, interview statements, and EPC J archives to determine the degree to which each was associated with translation, dissemination, and accessibility effectiveness. Graphical analysis, pattern matching, and contingency tables were used for the analysis.

**Triangulation and Validity**

The primary advantage of using case study inquiry is the opportunity to gather data from many different sources that can be triangulated (Patton, 2002, p. 559; Yin, 2003, p. 97). This study used a wide variety of data sources[51] and employed multiple methods to compare patterns in quantitative data with the details of more qualitative evidence. Triangulation of data gathered through multiple methods represents a type of comparative analysis that helped increase the understanding of the phenomena studied and provided more assurance about the accuracy of the findings (Patton, 2002, p. 558; Yin, 2003, p. 99).

[51] See, e.g., Babbie, 2004; Creswell, 1998, 2003; Krippendorf, 2004; Marshall & Rossman, 1999; Patton, 2002; Rossi, Lipsey & Freeman, 2004; Yin, 1994, 2003.

In triangulating, I cross-referenced, examined, and verified the findings among the sources. Moreover, I corroborated what the interview respondents reported with, for example, statements from telephone questionnaire participants, derivative products, archival records, and other written evidence including the Agency's statute, its budget, and testimony presented before Congress about AHRQ's activities. I also triangulated the findings within data sources. For instance, in the case of interviews, I compared what each informant said about a given topic. In doing so, I examined what was reported about the same factor both among and within types of data sources, seeking to identify any inconsistencies, weak degrees of congruence, and lack of support for specific findings.

In addition, this study used multiple data sources that provided multiple measures of the same phenomenon (Yin, 2003). To increase measurement validity, the dissertation's measures of variables like network complexity, strength of ties, dissemination, and public accessibility were examined with an emphasis on assuring that they were tapping the concepts they were intended to measure (Babbie, 2004). A measure that did not clearly tap what it was supposed to was either eliminated or re-categorized.

Although the idea of internal validity applies to causal inference, I adapted the notion to focus on ensuring that specific indicators were associated with each other without trying to establish causation. For example, I could have inferred that EPC Program I's degree of effectiveness was related to occurrences of one factor when in fact it was not. To probe for possible problems of internal validity, I made an extensive effort to address alternative factors that could have been associated with a given output from Program I. Examining such alternatives helped increase the overall internal validity of the study.

In addition, case studies depend on analytic generalization. This occurs when the researcher is trying to generalize a specific set of findings to a larger theory (Yin, 2003, p. 37). In order to generalize the findings from this study with greater confidence, the findings must be tested by repeating the analysis in circumstances in which similar results seem likely to occur, such as another government program that is contracting out and develops and operates in a complex network of public and private sector entities, or in later iterations of the EPC program (e.g., Programs II and III). Although the study has not yet been replicated, I sought to make it possible to do so by providing clear documentation of the procedures used to conduct the study. I tried to clearly state and examine the methods used, including how I categorized and analyzed the data as well as my expectations about the findings.

## Limitations of the Study

It should be reiterated what the research reported here did *not* strive to do. First, it did not try to explicitly demonstrate causal relationships. Instead, it focused on the existence and the strength of relationships between the identified dependent variables and potential influences. In addition, I did not attempt to conduct a process assessment that evaluated the equity, due process, or representativeness of EPC Program I. It also was not an evaluation of Program I's cost-effectiveness. Nor did it assess the validity or reliability of Program I's evidence reports or derivative products or evaluate the technical expertise or credibility of the organizations that AHRQ chose to serve as EPCs or partners. Additionally, I did not examine whether evidence reports or the derivative products were adopted by health care professionals, patients, or policymakers.

Rather, as a goal-attainment evaluation, the study assessed the extent to which EPC Program I achieved the Agency's mission of translating evidence reports, disseminating the

derivative products of those reports, and making the products accessible to the general public; and why it was as effective as it was. Thus, the dissertation is not an effectiveness analysis of the entire Agency. This study was limited as well to examining the outputs (products produced by the network actors) of EPC Program I, not its outcomes (e.g., the extent to which members of the public adopted Program I's products/outputs). It did not evaluate the effects of the translation and dissemination on either health services delivery or patient outcomes or the quality of database search engines or of the scientific rigor of articles that are published in peer-reviewed medical journals. As a result, the dissertation did not include the work of other organizations that might have adopted or referenced EPC Program I's evidence reports or derivative products. Instead, the research assessed translated, disseminated, and public access to derivative products that EPCs and partners were contracted to carry out for the Program.

This particular approach to evaluation and to trying to explain the accessibility of tools, programs, and policies has a limited focus. Consumers, health care practitioners and providers, patients, and policymakers who do not have access to the Internet or peer-reviewed medical journals were not represented. The data sources were confined to major databases (e.g., the National Library of Medicine, the National Guideline Clearinghouse) and peer-reviewed medical journals (e.g., the *Journal of the American Medical Association*, the *New England Journal of Medicine*, *Health Affairs*). Dissemination of tools, programs, and policies derived from AHRQ's EPC Program I evidence reports also may have occurred at medical conferences, at professional gatherings among colleagues or friends, or in newsletters that are distributed only in paper form. Due to the size and scope of the study, I could not identify, telephone, correspond with, or interview enough relevant people to determine the extent to which members of various groups had access to a particular tool, program, and policy. I made several attempts to interview

prospective respondents who had served on medical association committees that nominated EPC Program I topics that were selected. However, none of these attempts was successful. I was told by the organizations that nominated the selected topics that the members who nominate the topics are in most cases not on the committee after it was selected; they noted as well that it is too difficult to track down the members who serve on the committees because in most cases these are volunteer positions and members only serve for approximately three years at a time. Although EPC interview participants were members of at least one medical association that had nominated a selected topic, at no time had these participants served on the medical associations' committees that nominated a selected topic.

In addition, this dissertation is not a study in contracts or in the legalities of contracting, but rather it focuses on the effectiveness of a program that contacted out its work and operated in broad and complex network. There also may be alternative interpretations of some of the findings. That less money was appropriated to the Agency and its EPC Program, for example, may be the result of budget cutbacks, rather than efforts by Congress or the Secretary of HHS to exert coercive control over the Agency. I only speculate about the degree to which the funds that were appropriated to AHRQ were related to coercive control or to budget cutbacks that were independent of issues of coercive control.

Finally, this study did not dispute the Agency's clinical and service categories for the 93 evidence reports. Instead, it used the evidence-based topic categories established by the Agency as a basis for organizing and grouping the evidence reports. This in part was due to AHRQ being a science agency that employed a multitude of medical doctors, epidemiologists, and other health care professionals who grouped evidence reports and others similar products in such clinical

service categories, and also because the study's emphasis was not to challenge AHRQ about these types of groupings.

## Conclusions

The dissertation is an instrumental case study. This type of case study analysis provides insights into a broader issue, such as government contracting and operating in a complex network (Stake, 1995, p. 88). The approach also helps to refine theory in the area of network management (1995, p. 89) in developing effectiveness measures (Provan et al., 2007, pp. 509-10) at the network-level of analysis (Provan & Kenis, 2008, 229-30). Using multiple indicators and data collection methods and both quantitative and qualitative analyses helped to increase the validity of the study's findings (Yin, 2003; Creswell, 2003). To date, no other such effectiveness analysis of EPC Program I has been conducted (AHRQ, 2010; Chesley, 2003; Slutsky, 2006).[52] So that others might replicate the study and thereby perhaps increase the validity and reliability of its findings, I sought to provide clear documentation of the procedures used to conduct the study. The next chapter provides the findings on Program I's effectiveness.

[52] Document Review, "Impact Case Studies and Knowledge Transfer Studies" (AHRQ, 2010 [Current as of December 2010]). Also, see the Agency's GPRA Performance Plans for fiscal years 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, and 2011; and, the Agency's GPRA Performance Reports for fiscal years 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, and 2010.

# CHAPTER 5

## EFFECTIVENESS OF EPC PROGRAM I

This chapter examines the findings on the effectiveness of EPC Program I in four steps. First, to provide a frame of reference, I present an overview of the evidence-based topics selected during Program I. Next the chapter reports on translation effectiveness. Third, I discuss the extent to which EPC Program I achieved dissemination effectiveness, and, finally, the degree to which Program I met its pubic accessibility goals.

### Overview of Evidence-based Topics

Ultimately, EPC Program I focused on 93 evidence-based topics. AHRQ selected 50% more topics in the third year of the Program (fiscal 1999) than in the first two years, and the number rose even further in fiscal 2001. Meanwhile, the number of organizations nominating topics that received funding dropped after the first year but then peaked in fiscal 2001, when 44 organizations nominated topics that were selected (see Table 12).

(Table 12 about here.)

In addition, the types of organizations that nominated topics that AHRQ selected changed dramatically over the course of EPC Program I. In fiscal years 1997 and 1998, about 15% of the selected topics were nominated by public agencies, 65% by private entities, and 20% by public-private partnerships (PPPs). In fiscal 1999 and 2000, however, one begins to see changes in the types of organizations nominating topics that received funding: 57% public entities, 34% private organizations, and 9% PPPs. By the final year of the program, AHRQ's increased tendency to select topics that public agencies nominated could be seen even more clearly: government entities nominated 70% of the topics chosen. At the same time, selected topics nominated by PPPs decreased from 20% in fiscal 1997 to approximately 5% by fiscal 2001.

The nominated topics that AHRQ selected for further scrutiny in EPC Program I ranged across the 16 clinical categories and the 17th residual grouping. As Table 13 shows, the four categories with the most topics receiving funding focused on serious and relatively common problem areas in health care: Cardiovascular; Hematology and Oncology, Otolaryngology, Respiratory, and Allergic; and Neurology. Few evident patterns emerged, however, in the kinds of topics selected over the course of Program I.

(Table 13 about here.)

**Translation Effectiveness**

The more evidence reports that were drafted into derivative products (translations), the higher the degree of translation effectiveness. During Program I, not all the evidence-based topics that AHRQ selected for further study were drafted into evidence reports: 91 of the 93 topics selected were drafted into evidence reports. Perhaps more significant, these evidence reports were translated into a total of 191 derivative products, 98 more than the projected goal of 93.

Of the 91 resulting evidence reports, at least 70 (77%) were drafted into derivative products, and good deal of variation in reports translated is evident across the clinical categories. In Topics not Categorized 19 topics were converted into 22 derivate products[53] (translation per topic ratio of 1.157), compared nine topics converted into 22 products (ratio = 2.444) in the Hematology and Oncology category. Four topics were converted into 18 products (ratio = 4.5) categories such as Oral and Gastrointestinal, Otolaryngology, Respiratory and Allergic 11 topics were converted into 32 products (ratio = 2.909), and in particular, Ophthalmology converted (ratio = 5.5) noticeably more topics into products than the number of might have led one to

[53] A product is determined to be associated with a specific evidence report when the EPC that drafted the report or the partner that nominated the topic of the evidence report directly references the specific report in the derivative product. (This is stated in the protocol used for determining when a product is a derivative of an evidence report.)

expect (see Table 14.) In contrast, evidence reports for topics in Dermatology and Endocrinology yielded one derivative for each report.

(Table 14 about here.)

Important differences also appeared among the actors involved in translation. The EPCs translated evidence reports into significantly more products (126 out of 191) than did the partners that nominated the topics (65) (see Table 15). The main difference between the two is that partners were primarily medical associations with a memberships comprised mainly of physicians who treated patients in everyday health care delivery. The EPCs for the most part are units of teaching hospitals whose fulltime faculty members are research scientists. Although the majority of partners sponsored at least

(Table 15 about here.)

one peer-reviewed medical journal (e.g., the *Annals of Internal Medicine, Circulation*), units of the teaching hospitals are well known for the quality and quantity of articles that the faculty and staff author.

Nonetheless, the partners entered into agreements with AHRQ to translate the evidence reports, while AHRQ contracted with the EPCs to generate the evidence reports and assist the partners in translation. That the partners translated evidence reports into 34% of the products indicates a rather low level of effectiveness for the entities with the major responsibility for translation.

Another measure of translation effectiveness is time — the number of months between completion of an evidence report and publication of a derivative product. Looking across the clinical categories, one sees that to translate the findings from the evidence report it took the partners and EPCs between nine months *before* the evidence reports were published and 27

months after the evidence reports were published (see Table 16). Across the clinical categories overall, it took a mean of 12.5 months (median = 11 months) to translate evidence reports into products, with partners spending a mean of 11.9 months (median = 12.5 months) and EPCs a mean of 12.44 months (median = 10.5 months) (see Appendix H). Considerable variation appeared among the clinical categories. Evidence reports in the Cardiovascular and Health Care Services

(Table 16 about here.)

categories took an average of ten months to translate. In contrast, translation for topics in Neurology and Methodology took 22 months. The time it took to translate evidence reports on specific topics also differed. For example, for the evidence report on "Otitis Media with Effusion" in the Otolaryngology, Respiratory and Allergic clinical category, two different products (ultimately, articles in medical journals) were produced 21 months before the evidence report was completed and released to the public. This is significant because the products were published prior to Program I's peer-review panels' approval of the evidence reports. (Program I had a peer-review process and panels designated for each evidence report as Chapter Two described.)

Further, when looking across the clinical categories I found that products published before the evidence reports were peer-reviewed were not unusual. Fifty-six products of the evidence reports underwent an accelerated peer-review process. Overall, the EPCs generated (61%) more of such products than did the partners. The products are found across ten (63%) different clinical categories and in each year of Program I (see Table 17). Considerable variation

also appears in the clinical categories that contain products of evidence reports that underwent an accelerated Program I peer-review: 62% in Cardiovascular and 91% in Ophthalmology compared to 14% in the Hematology and Oncology category. Individual examples include a

(Table 17 about here.)

product on the "Management of Stable Angina" topic in the Cardiovascular category, and another two products on the "Treatment of Coexisting Cataracts and Glaucoma" in the Ophthalmology category.

At the other extreme of time to translation, it took 59 months to translate a product (an educational product) on the "Milk Thistle Effects on Liver Disease" in the Complementary and Alternative Care category; 54 months to translate a product (a guideline) on "Evaluation of Cervical Cytology" in the Gynecology/Obstetrics and Neonatal category; and 53 months to translate a product (an article that appeared in a medical journal) on "Testosterone Suppression Treatment for Prostate Cancer."

Overall, however, since the data in evidence reports become obsolete within 60 months of their publication unless they are verified or updated (American Medical Association 2001, 2003, 2006, 2010; National Guideline Clearinghouse 1999, 2001, 2006, 2010), with only a few exceptions these translation times point to relatively high levels of effectiveness.

**Dissemination Effectiveness**

As noted earlier, the distinction between translation and dissemination – although analytically clear – often is difficult to delineate empirically. Two of the conclusions about translation effectiveness also apply to dissemination effectiveness: first, the evidence reports provided the bases for developing close to 191 separate derivative products. Second, the time to produce the derivates was within the five-year lives of the data on which they were formulated.

One hundred and fifty-six different websites and five databases disseminated (i.e., had links to) the derivative products (see Table 18). These sites included a total of 6,614 links to the products, with a median of 40 links (std. dev. = 118.906). In general,

(Table 18 about here.)

the number of links to the derivative products suggests a relatively high degree of dissemination effectiveness. One sees considerable variation in the number of links to products across clinical categories. In the Cardiovascular category, for instance, there were links 1258 to 29 products (ratio = 43.379) while in the Health Care Services category there were 691 links to products 11 (ratio = 62.818). In the Cardiovascular category, many of the partners that nominated the evidence-based topics translated the completed evidence reports into clinical practice guidelines. Links to such guidelines typically were available from the partners' websites, the journals in which they were published, the National Guideline Clearinghouse, the National Library of Medicine's Medline (PubMed) database, and the Web of Science database. In the Neurology category, however, the EPCs translated most of the products. Links to EPCs' products (virtually always articles) were available from the journals in which the products were published and typically also from the Medline (PubMed) and the Web of Science databases. However, additional links to these EPC products from partners' websites or other databases often were not available. I attribute this finding to differences in the nature of the products generated by the partners and EPCs. Partners often translated the evidence reports into clinical practice guidelines rather than journal article products as authored by the EPCs. Although the partners authored significantly fewer translations than the EPCs, products in the form of guidelines usually generated significantly more links and were available online for free to the public immediately after publication.

Yet the partner organizations that nominated the evidence-based topics selected for EPC Program I used only 45 (48%) of the 93 selected topics to develop (translate) and disseminate derivate products. In one instance, the partner used a single evidence report on a topic it had nominated to disseminate four separate products. In another three cases, the partner used a single evidence report it had nominated to disseminate three products. Sixty-five of the 191 (34%) total products were developed and disseminated by the organizations that nominated the topics, which arguably is a somewhat lower number of partner translations overall than might have been expected, especially considering that the nominating partners were responsible for developing translations that could be used to treat patients in everyday health care delivery. The finding signals that if the partners had used each of the 93 topics to develop products, dissemination rates could have been far higher.

Although the 6,614 links to products across 156 websites and five databases indicate a relatively high level of dissemination effectiveness that the partners used less than 50% of selected topics to develop products that could have been disseminated may signal a somewhat lower degree of overall dissemination effectiveness for Program I.

**Supplemental Data**

To supplement these data on dissemination effectiveness, I gathered the annual number of subscriptions for each of the 66 journals that published Program I articles. Subscription rates were available for 80% of the journals, and the journals together had an estimated 1,654,427 subscribers (see Table 19)[54]; the median number of subscriptions per journal is 105,000.[55] *JAMA* (543,337) had the greatest number of subscriptions and the *Journal of Pain and Palliative Care Pharmacotherapy* (529) the fewest. Significant variation also is seen in the numbers of

[54] Not every journal in which a Program I product appeared provided information about the number of subscriptions. In such cases, the term "unspecified" is located next to the title of the journal (see Table 19).
[55] The median was 10,700 annual journal subscriptions, and the mode was 20,000 annual subscriptions.

(Table 19 about here.)

subscriptions (std. dev. = 805,000) (see Appendix I). For instance, subscriptions to *The Journal of Family Practice*, (87,523), *Ophthmalogy*, (25,498) and *Statistics in Medicine* (1,800) differ considerably.

Although 37 (55%) of the journals published only one article authored by Program I actors, the mean number of such articles published in each journal is two.[56] Journals in which more Program I articles appeared include the *American Family Physician* (9), *Chest* (9) and the *Journal of American Medical Association* (10). *American Family Physician* (190,948) and *JAMA* (543,337) are among the periodicals that have the most subscriptions and also are those in which Program I products were published most often. Thus, including two of the three journals that had the greatest number of Program I articles published indicates a somewhat higher degree of dissemination effectiveness. However, this is not the case for the *British Medical Journal* with 139,000 annual subscriptions, a fairly high number compared to the other 65 journals; only one article authored by a member of Program I appeared in this journal. This is an anomaly when juxtaposed with the number of Program I articles published in journals with comparable numbers of subscriptions. Another anomaly is found in the case of *Chest* with 23,000 annual subscriptions, which published nine Program I articles, the same number that was published in the *American Family Physician* and just one fewer than in *JAMA*.

The *British Medical Journal* and *Chest* aside, little variation is found among the journals in the number of Program I articles published and the numbers of subscriptions. For example, only one Program I article appeared in *Blood*, *Cancer*, *Dysphagia*, *Disability and Rehabilitation*, *Evidence-based Medicine*, the *International Journal for Quality in Health Care*, *PharmacoEconomics*, and *Spine*, journals with fewer numbers of subscriptions. With the

[56] Both the median and the mode were one article published per journal.

exception of *Chest*, specific journals in which Program I articles appeared most had more subscribers.

In sum, the number of Program I evidence reports and products disseminated suggest relatively high dissemination effectiveness. The number of websites that provided links to the evidence reports and the products also indicate relatively high dissemination effectiveness, as do the number of links to evidence reports and products.

**Accessibility Effectiveness**

Overall public accessibility to EPC Program I's 93 evidence reports was lower than I expected. Public access to information on 17 of 19 of the evidence-based *topics* that were nominated by HHS units ultimately changed from restricted to unrestricted access (Document Review, 2004, 2006, 2009, 2010, 2011). One of the 19 evidence-based topics was unrestricted during EPC Program I. Sixteen more of the 19 topics became unrestricted during EPC Program III. Units in the U.S. Department of Health and Human Services nominated all of these topics,[57] and, unlike most of the other topics with unrestricted access, a single government agency nominated each of the 19 topics. Sixty-eight percent (13 of the 19) topics in this category were selected in FY 2001, compared to 16% (three of the 19) in fiscal year 2000 and in fiscal year 1999 (see Table 13). Prior to FY 1999, evidence-based topics that a federal agency nominated either individually or in partnership with one or more private organizations were accessible to the public.

During the George W. Bush administration (January 20, 2001, to January 20, 2009), only a single completed evidence report on one of the 19 topics was available with no restrictions to

[57] The HHS units that nominated these topics were the Centers for Medicare and Medicaid Services (formerly the Health Care Finance Administration) (10), the National Institutes of Health (3), and AHRQ (6). Public access to 18 of the 19 evidence-based topics selected by EPC Program I had been restricted until 2010, approximately one year after President Obama took office. It is worth noting that none of the 19 selected evidence-based topics was nominated by a state or local government agency.

the public — "Refinement of Quality Healthcare Cost Utilization Project Indicators." Yet derivative products from the associated partner and EPC could not be found for the single completed evidence report (one of the total 19 topics) with unlimited access. In fact, AHRQ's Center for Organization and Delivery Studies nominated this topic (that had unlimited access).[58] Public access to information on the other 18 (of the total 19) topics, at least 12 of which had derivate products yet the accompanying evidence reports for these 12 topics was restricted.[59]

In contrast, 80% (75) of the evidence reports were accessible to the public on AHRQ's website, on the 12 Evidence-based Practice Programs' individual websites, and through the National Guideline Clearinghouse database; links also were provided to AHRQ's website by more than 128 (of the 143) organizations (about 90%) that nominated topics selected by Program I. Additionally, links to unrestricted evidence reports were available on the Cochrane Collaboration Library database, and the National Library of Medicine database.

In 2010, shortly after President Barack Obama took office (January 20, 2009), links to 98% (91) of the Program I evidence reports became fully accessible to the public on AHRQ's website; the 12 Evidence-based Practice Programs' individual websites, and through the National Guideline Clearinghouse database. In addition, links to the evidence reports also appeared on the websites of nearly 90% of the organizations that nominated topics selected by Program I. Links to these evidence reports also were available on the Cochrane Collaboration Library database, and the National Library of Medicine database.

[58] The "Refinement of Quality Healthcare Cost Utilization Project Indicators" topic was selected for funding by AHRQ in FY 1999 during Bill Clinton's presidency (January 20, 1993 to January 20, 2001).
[59] One of the 12 topics was selected for funding in FY 1999, another in FY 2000, and the remaining ten topics were selected for funding in FY 2001.

When attention turns to the derivative products disseminated during EPC Program I, only 66 of the 191 products (34%) were accessible to the public immediately after being released without some type of monetary charge[60] (see Table 20).

(Table 20 about here.)

Overall, 35 (53%) of these products were accessible free of charge through the federal organizations that nominated the related evidence-based topic. Only 49 (74%) of the 66 accessible products were fully accessible on major health care databases, such as the National Library of Medicine (including Medline and PubMed).[61] Yet 17 of the free online accessible products were not available on major databases, but instead limited to a few websites (e.g., policy reimbursement products on the CMS website).

The extent of unrestricted access also varied by clinical category. For example, 60% of the products in the Complementary and Alternative Care category were fully accessible, compared to 47% of those in the Neurology, 45% in Hematology, 41% in the Cardiovascular, 34% in Otolaryngology, Respiratory and Allergic, and 22% in the Musculoskeletal categories. Meanwhile, despite the presence of translated products, none of the categories had full, immediate access to all of the products generated.

Access to the remaining 65% (125) of the products was possible for subscribers to specific medical journals. Overall, public access to these products was limited. The National Library of Medicine database provided an abstract for each of the 125 derivative products.[62]

Free online access to the products changed over the course of Program I. Total public accessibility rose by 10% when 19 articles appeared in journals that provided public accessibility

[60] This includes eight derivative products that were disseminated by the Centers for Medicare and Medicaid Services (CMS) for which access to the dates the evidence reports were completed was unavailable to the public.
[61] As mentioned in dissemination effectiveness, the National Guideline Clearinghouse also provided links to the 18 products (clinical practice guidelines authored by the partner entities).
[62] Access to the 125 products also was available on the Web of Science database for a monetary charge.

six months after publication (see Table 21). This increase in public access affected ten of the clinical categories. However, it is most evident when one looks at the Endocrinology and Psychiatry and Substance Abuse categories where a 0% to 100% increase occurred in each. Increases in public access also appear in the Cardiovascular (7%), Health Care Services (26%), and Musculoskeletal (22%) categories.

(Table 21 about here.)

In addition, three articles were published in journals that granted free online access to their contents twelve months after publication (88 of the total 191 products were publicly accessible without a monetary fee assessed). Looking across the clinical categories, accessibility rose in Health Care Services (from 33% to 50%) and in Otolaryngology, Respiratory and Allergic (from 38% to 45%). Thirteen months after publication and later, no further increases to public accessibility occurred.

To date, full online accessibility to the remaining 54% (103 of the total 191) products is possible only for subscribers to specific medical journals. On the whole, public access to these products was limited. As already noted, the National Library of Medicine database provides an abstract for each of the 103 derivative products.

Important differences also appeared among the products authored by organizations involved in Program I. The actors that were responsible for translating the evidence reports, the partner entities, typically translated the evidence reports into products that could be directly used in the delivery of health care to patients. Partner-authored products such as clinical practice guidelines and reimbursement policies typically were accessible online for free immediately after publication. However, products in the form of published journal articles most often were authored by the EPC organizations, and online public access to the articles generally required a

monetary fee across the three access types (immediately after publication, six months after publication, and one year after publication). Since 126 of the 191 total products generated during the Program I were published articles, this had a direct impact on accessibility effectiveness.

Finally, whether or not accessibility was restricted, derivative products on average could be accessed in three or fewer steps ("clicks") on all of the websites that provided such information. Moreover, each website included links for particular groups like patients and health care professionals. Since sites organized in this manner seem likely to make information more accessible to members of the groups with designated links, this suggests relatively high access effectiveness.

**Supplemental Data: Access Policies of Journals**

Attention now turns to supplemental data gathered on journals' access policies. Sixty-six journals published products generated from Program I. Nearly 70% of the products were articles that were published in 66 journals (see Table 22). Variation appeared in the number of months after publication that journals offered public access to the articles. Twelve percent (eight) of the journals provided full access to the articles immediately after publication. Two more (3%) journals granted access to the articles six months after publication. Twelve months after

(Table 22 about here.)

publication, two additional journals provided full access to the articles. Overall, 18% of the journals provided public access to Program I articles 12 months after publication.

I also examined the number and proportion of journals that appeared in more than one language. Article-products published in multiple languages suggest an increase in public access. Four (6%) of the 66 journals provided contents in multiple languages (see Table 22).

Looking across the clinical categories, one finds considerable variation in the number of the languages and the number of Program I clinical categories of the articles that appeared in these publications. These increases in public access affected ten of the clinical categories. However, it is most evident when one looks at the Endocrinology and Psychiatry and Substance Abuse categories where 0% to 100% increases occurred in both (see Table 21).

Specifically, the *British Medical Journal* published its contents in ten different languages. This many different language editions could be linked to higher accessibility effectiveness. However, as already noted, only one Program I article appeared in the *British Medical Journal*. *The Cochrane Library* offered its contents in two languages, and a total of five articles from Program I appeared in the journal database. Also, *JAMA* published six different language editions, and ten of Program I's articles appeared there. *Pediatrics* offered two different language editions and published four Program I articles.

In terms of accessibility overall, the number of clicks taken to access EPC Program I evidence reports and derivative products indicate somewhat higher levels of accessibility effectiveness. Links for specific groups (e.g., "patients," "health care professionals") from the websites also suggest high accessibility effectiveness. Additionally, the supplemental data tapped by the number of journals and the number of language editions in which Program I products were published indicate high accessibility effectiveness.

However, these findings become less relevant when public access to evidence reports is restricted or when full access to the derivative products requires a monetary fee. Until 2010, public access to nearly 20% of the evidence reports created in Program I was restricted. Meanwhile, fewer than half of Program I's derivative products were fully accessible without a

fee, indicating lower levels of accessibility effectiveness. In sum, these findings suggest relatively low levels of accessibility effectiveness.

## Conclusions

The findings across EPC Program I's three dimensions of effectiveness are somewhat mixed. The evidence on translation suggests that Program I was relatively effective in translating the majority of the evidence reports on the topics selected in a timely manner and in disseminating the derivative products.

Shortly after President Obama took office, the general public acquired access to nearly all evidence reports generated under Program I. Prior to this, public access to almost a fifth of the evidence reports was restricted to the public. AHRQ selected the majority of these topics for funding in the last year of Program I during the George W. Bush administration.

However, free online access to Program I *derivative products* varied little if at all between presidencies. Although Congress specified that the Agency provide wide public accessibility to the evidence-based practice products[63] it supported, March 2011 fewer than half of the Program I's derivative products were fully accessible to the general public without a monetary fee.

Yet accessibility effectiveness varied significantly by the type of organization involved. For example, translation effectiveness was lower when the number of products authored by partner entities is compared to the number completed by EPC organizations. Since partners typically authored free, publicly accessible products had partners developed, more products accessibility effectiveness would have been higher. The type of organization that authored products also could have had a direct impact on dissemination and accessibility effectiveness and

[63] The EPC Program refers to "evidence-based practices" as products (AHRQ, 2001; [Current as of October 2010].)

may have had a more immediate and direct impact on the quality of everyday health care delivery.

In addition, the number of evidence-based topics selected for funding grew and the type of organization involved changed significantly over the course of EPC Program I. Congress mandated that AHRQ link scientific evidence to clinical practice by operating in a multidisciplinary network of public-private partnerships located at several levels (national, state and local) and in geographically diverse regions (U.S. Public Law 106-129). However, by the end of EPC Program I, nominators of selected topics were dominated by single partners (i.e., individual organizations) that often were public agencies and, in many instances, units of HHS.

Additionally, the type of disease or health care service was relevant. The amount of time taken to translate evidence reports into derivative products clearly varied across clinical categories. For instance, 18 products from the Cardiovascular category underwent an accelerated time to translation, compared to only eight products in the Otolaryngology, Respiratory, and Allergic category.

On the whole, these findings suggest many implications. First, the number of HHS units that nominated selected topics towards the end of Program I indicate that the offices in federal agencies may have needed and hoped to apply evidence-based research. The number of evidence-based topics that AHRQ selected for each clinical category also varied considerably. The findings imply that EPC Program I chose topics in large part based on their perceived value to the U.S. population. For example, the Cardiovascular category contained 12 topics, while the Dermatology category had only one. The severity, frequency, and costs of cardiovascular disease far exceed those of most skin diseases or conditions, heightening the benefits of collecting and communicating information on useful treatments. The variation across the clinical

categories in the number of products with an accelerated time to translation also suggest that Program I and the health care community perceived a more immediate need for products related to treating cardiovascular conditions than, for example, allergies in the U.S. population.

Second, from a policy standpoint, the increases in topics selected and products disseminated suggest a clear and rising demand for evidence-based research. The health care community received evidence reports in the categories of Otolaryngology, Respiratory, and Allergic and Oral and Gastrointestinal, for example, and Program I network entities authored multiple translations (products) from these reports.

The next chapter turns to exploring the possible relationships between the study's explanatory variables and EPC Program I's translation, dissemination, and access effectiveness.

# CHAPTER 6

## EXPLAINING PROGRAM I'S EFFECTIVENESS

Chapter Five described the findings on EPC Program I's effectiveness. This chapter explores *why* Program I was as effective as it was — the second goal of the dissertation.

### Exploring the Relationships between the Variables

I found variation in the levels of effectiveness across the study's three dimensions of Program I's effectiveness — translation, dissemination and public accessibility. To help explain this variation, I examined each of the possible relationships between these dimensions and the independent variables included in the propositions and hypotheses that Chapter Three introduced.

As will be seen, overall somewhat limited support is found for the three propositions and three hypotheses. Yet the analysis reveals important information about the extent and the nature of Program I's effectiveness. The results provide insight into the possible future effectiveness of the EPC Programs and other programs that are similar to it.

### Coercive Control Exerted over AHRQ

I begin with Proposition 1, which predicts a negative relationship between coercive control exerted over AHRQ by Congress and the Public Health Service (PHS) and Program I's effectiveness. The number of compulsory deadlines found in the Agency's statute and the number of congressional and PHS monetary sanctions against AHRQ are the two measures of coercive control.

**Statutory deadlines**. Eighteen different compulsory deadlines appeared in AHRQ's statutory mandate (see Table 23). This arguably is a large number of deadlines contained in a single statute and suggests a relatively high degree of coercive control that Congress exercised over the Agency. AHRQ complied with 94% of these

(Table 23 about here.)

deadlines. However, only one deadline applied to AHRQ's EPC Program I[64]—the FY 2000 deadline: "Report on methods that AHRQ and its contractors use to rate the evidence in developing evidence reports…" (U.S. Public Law 106-129). This deadline substantively related to developing evidence reports. It was not related to the methods used in translating the evidence reports into products, to supporting wide public accessibility to the completed evidence reports, or to disseminating the derivative products generated during Program I. In FY 2000, AHRQ's EPC Program I failed to meet its only compulsory deadline, submitting the report the following fiscal year.[65]

Next, attention turns to examining possible monetary sanctions against AHRQ imposed by Congress and PHS that could have been applied as a result of this missed deadline.

**Financial sanctions.** The number of congressional and PHS monetary penalties that could have been used against the Agency serves as the second indicator of coercive control.[66] Looking across each year of Program I (1997 to 2002), no financial sanctions were levied against AHRQ. Further, when attention turns to a prospective decrease in funds following the Agency's missing the fiscal 2000 deadline, from FY 2000 to FY 2001, funding increased by more than $65 million (see Table 1). This is the largest increase in funding from the time the Agency was reauthorized until fiscal 2009.

[64] The remaining compulsory deadlines applied to units of the Center for Quality Improvement and Patient Safety and to the Center for Financing, Access and Cost and Trends.
[65] The statutory deadline for FY 2000 was the most specific deadline in AHRQ's statute. Not only was the fiscal year included, but also the specific month that the report was required—December 2000. Furthermore, this is the only compulsory deadline that applied to the EPC Program, a unit of the Center for Outcomes and Effectiveness.
[66] In an effort to further explore coercive congressional control that might have been exerted over the Agency, I also reviewed testimony presented before Congress by AHRQ staff members. AHRQ staffers testified before Congress 28 times from 1996 to 2005. In every case, such testimony involved either routine budget justification (that federal agencies present before Congress each fiscal year) or appeared to be an effort by members of Congress to gather information on, for instance, medical errors and infant immortality rates, rather than to exert coercive control.

The Agency's EPC Program housed the technical expertise needed to meet the FY 2000 deadline.[67] Somewhat surprisingly, the number of total topics authorized for funding from FY 2000 (18) to FY 2001 (32) increased by 78% (see Table 12). This increase was significant because it affected Program I's overall budget and operations in FY 2001. The HHS Office of the Secretary authorized the increase in the number of topics that the EPC Program selected for funding, and an increase in AHRQ's total funding followed (Interview, 2005).

In addition, the total number of topics that the EPC Program was authorized to select for funding remained about the same for Program II — 95 topics were selected for funding compared to 93 selected topics during Program I (AHRQ, 2001, 2010). Furthermore, authorization for the number of topics to select for funding came from the HHS Office of the Secretary[68] during Program I, a practice that continued in Programs II (2002 to 2007) and III (2007 to 2012) (AHRQ, 2001, 2010). I interpret this to mean that HHS officials thought that the evidence-based research was needed. With the HHS Office of the Secretary determining how many total topics EPC Program I was authorized to select for funding, analysis of the data suggests that the practice became institutionalized and perhaps serves as another indicator of coercive controls over AHRQ that could be exerted within HHS.

I also conducted interviews to gain further insight into the possible relationship between the nature of control exerted over the Agency by Congress and PHS and Program I's effectiveness. The administrative and research positions of four of the 16 respondents interviewed allowed them to offer informed statements about possible coercive control exercised

[67] The EPC Program did eventually meet the FY 2000 statutory objective, but almost a year and a half later in April 2002 (AHRQ, 2002).
[68] Donna Shalala served as the Secretary of the HHS during EPC Program I.

by Congress over the Agency.[69] According to two of the four individuals, Congress did not explicitly specify how AHRQ staff members should carry out its mandate; nor did Congress sanction or deny the Agency funding. Another respondent noted that a few AHRQ staff members reportedly provided feedback to congressional staff members in drafting the Agency's mandate. This feedback was not in the form of testimony before Congress. Instead, AHRQ's staffers provided their professional expertise to the congressional staffers on what should be included in the Agency's reauthorizing legislation. Finally, a fourth respondent commented that before AHRQ's mandate was drafted, at least a few members of Congress wanted to require that the Agency explain how it used monies from the Medicare Trust Fund. Thus it appears that these members wanted either to enforce explicit control over how AHRQ could use money that was allocated from the Trust Fund or to not reauthorize the Agency. The respondent reported that when the Medicare Trust Fund allocations to AHRQ stopped, so did congressional questioning about how the Agency used the allocations. As Table 1 shows, allocations from the Medicare Trust Fund to AHRQ ceased in fiscal 1996. Appropriations and PHS allocations to the Agency did not stop.

Analysis of these data indicate that the statute's "compulsory" FY 2000 deadline was in an instance of failed coercion by Congress: AHRQ's missing the FY 2000 deadline did not produce financial sanctions against the Agency (or its EPC Program) the following year. This failure could be attributed to the well documented uncertainty about which methods are best to

[69] Initially, all interview respondents were probed about possible coercive control that was exerted over the Agency by Congress. The questions included: "Did the mandatory deadlines in the Agency's authorization affect your ability to do your job; if so, how if at all were these deadlines enforced [by Congress and political appointees]; did the requirement that you work with organizations that were outside of AHRQ and the federal government have an impact on the outcome of translation and dissemination; if so, how; can you give me some examples; how do you think your job could have been done differently?" (see Appendix F: Unstructured Interview Questions).

use in EBM when rating the evidence for systematic reviews (Background Information, 2006; Fink, 2005).

As Chapters One and Two discussed, health services research is a relatively new area of study and practice that is devoted to improving everyday health care outcomes in access to care, cost, and quality. Ambiguity in the EBM and HSR policy arena about the best method to rate scientific medical studies may have made Congress less likely to impose sanctions on an agency charged with such tasks. In some instances a collaborative relationship can develop between Congress and an agency when they operate in a similar context for a relatively long time, evidently resulting in mutual influence over one another's behavior (Ginieczki, 2010; Waterman and Meier, 1998, p. 192). The relationship between Congress and AHRQ could have transformed from top-down interaction to non-hierarchical information sharing about issues including the well documented ambiguity in the HSR policy arena.

Overall, no support is found for Proposition 1.

**Network Centralization**

Hypothesis 1 predicts a positive association between network centralization and program effectiveness. Two measures tapped network centralization: the extent to which AHRQ's EPC office organized the network activities of Program I and the number of times the EPC office directly distributed money to the EPC contractors for services rendered.

Limited support is found for the hypothesis. In more than half of the possible relationships examined, the direction of the association between the variables is positive as predicted. First, I discuss the findings for each indicator of network centralization. Next, the evidence for the relationship between network centralization and program effectiveness is presented.

**Network activities coordinated.** Results from pattern matching among work documents, statements given by seven interview respondents, and information from the EPC J archives indicate that the EPC office organized a total of six network activities that focused on fulfilling the goals of Program I (see Table 24).[70]

(Table 24 about here.)

The EPC office coordinated the six network activities a minimum[71] of 1756 times throughout Program I (1997 to 2002), and no other network entity organized these six tasks. Thus, the EPC office coordinated more than one network activity each workday, which arguably indicates a relatively high level of network centralization.

Yet only two of the six network activities substantively related to carrying out translation, dissemination, and accessibility tasks: "coordinate EPC topics and partner assignments for the evidence reports" and "distribute the names of journal symposia and contact information to the EPCs for possible product publication" (see Table 25). The EPC office coordinated the EPC topic and partner assignments for the evidence report a total of 236 times. Each time a topic was

(Table 25 about here.)

selected, the EPC office assigned the topic and the role of the EPC (develop and draft the evidence report) and of the partner (assist the EPC develop the evidence report, translate the evidence report into a product, disseminate the product to its memberships, and provide access to the product).

[70] The six network activities that the EPC office coordinated are presented in sequential order as described in work documents, interview respondents' statements, and in the EPC J archive.

[71] The word "minimum" used in this context means that the network activities, particularly in the case of "distribute AHRQ EPC conference and EPC conference information," very well could have been coordinated by the EPC office more times than was reported in work documents and by interview respondents. Circulating such conference information for similar events typically involves distributing the information more than twice a year.

In the last two years of Program I, the EPC office twice distributed the names of journal symposia to the EPCs for possible product publication, For example, in 2000 and 2001, the office coordinated the distribution of information about two different prospective journal symposia on evidence-based medicine to the 12 EPCs. In the information distributed, the EPC office included the journal editors' names, addresses, and telephone numbers, and suggested that the EPCs submit products for publication in the two journals. In both journals, full access to such products eventually was free: the first journal provided free online access to products immediately upon publication, and the second offered the products without fees six months after publication.[72] This suggests that the EPC office's distribution of such information was associated with the steps needed for accessibility effectiveness.

The journal that published or posted Program I's products on its website ultimately determined whether products would be accessible to the public without a fee. Both of the journals for which the EPC office distributed symposia information provided free public access to products. Thus, there could have been a direct relationship between distribution of such information and the degree of accessibility effectiveness. This becomes especially important when one considers that the EPCs authored products in the form of published journal articles for which full online public access typically required a monetary charge and the EPCs authored 126 of the 191 products generated by Program I. *If* the 12 EPCs had submitted products for publication to the two journals and *if* the journals published the products, a somewhat higher degree of accessibility effectiveness would be seen for these products. However, EPC products were not published in either of the prospective journal symposia. As a result the degree of Program I effectiveness could not be assessed in either instance.

[72] EPC symposia publications were not found in either journal for the products generated from Program I.

The EPC office coordinated translation, dissemination and accessibility network tasks 14% (238 of 1756) of the total number of times possible. The remaining 86% (1518 of 1756) of the network activities the EPC office organized were devoted to tasks that were substantively linked to evidence report development, including "distribute evidence report RFPs to the 12 EPCs," "assign task orders to EPCs," "assign a task order officer to oversee the work of drafting the evidence report," and "distribute AHRQ EPC conference and EPC conference information."[73] Very few of these tasks related to the partner entities that were charged with carrying out program effectiveness for each topic that EPC Program I selected to fund. In general, when tasks shifted to the activities needed to attain translation, dissemination, and access effectiveness, actors in Program I operated in a more decentralized network.

**Network activities coordinated and effectiveness.** Next, I explored the possible relationship between this somewhat decentralized network and translation, dissemination, and access effectiveness for all of Program I, and for the partner and EPC organizations.

***1. Translation effectiveness***. One of the three possible relationships between a more decentralized network and the number of evidence report translations supported my prediction (see Table 26). A decentralized network tapped by number of tasks organized by the EPC office was associated with fewer partner-authored products (65 of the total 191 translations).

However, as network centralization decreased, the number of EPC translations (126 of the 191 products) and Program I translations (191) increased, the opposite of what I predicted. These results may be attributed to the nature of EPC entities. For the most part, EPCs were

[73] It is worth noting that coordinating tasks within the Program I network was *not* all that AHRQ's full-time staff members were responsible for organizing. AHRQ's EPC Program is located within the Center for Outcomes and Effectiveness (COE), whose full time staff members often were assigned roles and responsibilities that were located across various programs and units of the Center, including organizing tasks as discussed for EPC Program I (AHRQ, 2005).

teaching hospitals and are well known for the quality and the quantity of the published articles that their faculty and staff author. Since the EPCs drafted the findings from systematic reviews

(Table 26 about here.)

for publication regularly regardless of whether they were under contract to AHRQ, this could help explain why a decentralized network with fewer network translation activities organized was associated with greater translation effectiveness as tapped by the numbers of EPC and Program I products overall.

Attention turns next to the number of network translation-related activities that the EPC office organized and the number of months (*"time"* hereafter) it took to translate evidence reports. None of the three possible relationships examined supports my prediction about the direction of the relationships (see Table 26). [74] The results suggest that the decentralized network was associated with a relatively higher level of translation effectiveness as measured by the time taken to translation.[75]

Yet I speculate that the higher levels of translation effectiveness on the time taken (for partner, EPC, and Program I) to translation might be explained by partner entities and EPC organizations possibly translating the evidence reports without working together. Since the partner and EPC organizations were the actors that translated the evidence reports, both comprise EPC Program I's total number of months taken to translate evidence reports.

***2. <u>Dissemination effectiveness</u>***. Next I examined the relationship between the number of network activities organized and links to products; none of the three possible relationships

[74] That is, fewer network translation activities organized were associated with higher levels of translation effectiveness as tapped by time to translation.

[75] It took a mean of 12.47 months (median = 11 months) from completion of the evidence report to publication of the product for Program I overall, a mean of 12.69 months (median = 11.5 months) for partners, and a mean of 10.91 months (median = 10 months) for the EPCs. This is a relatively brief amount of time, indicating higher levels of translation effectiveness.

supported my predictions (see Table 26). As network centralization decreased, partner, EPC and Program I dissemination effectiveness increased. This is in the opposite direction of what I predicted. Because nearly every partner sponsored at least one peer-reviewed journal that typically included a database, one could infer that the partners' and the EPCs' opportunities for disseminating their products were quite numerous.

***3. Access effectiveness.*** Yet when examining the relationship between network centralization and the three types of free online access to products (immediately, six months after and one year after publication), all nine of the possible associations support my predictions. As organizing the steps needed for accessibility effectiveness decreased, free online access to products also decreased. Had the EPC office coordinated the tasks needed for accessibility effectiveness, such centralization very well could have led to higher accessibility effectiveness in the number of publicly accessible free online products.

**Distribution of money to EPC contractors.** The number of times the EPC office directly distributed money to the EPC contractors for services rendered is the second measure of network centralization. Analysis of the data gathered indicates that the EPC Program office directly distributed money to the EPC contractors for services rendered for each of the 93 evidence reports. Furthermore, these contractors were paid quarterly, and money was distributed by only one network entity, the EPC office. Yet only two contract deliverables substantively related to the steps needed to translate evidence reports and to disseminate and provide access to the derivative products effectiveness; by FY 2000, the EPC Program office did not require the EPCs to carry out either of the tasks.

Again, when the work shifted to translation of the evidence reports and dissemination and public access to the derivative products, the results suggest that the actors in EPC Program I

operated in a more decentralized network, the opposite of what was predicted. I attribute this to the cultural entrenchment of a limited government approach to how physicians should deliver everyday health care to patients. As previous chapters mentioned, AHRQ faced extinction in 1995 due to its being seen as a standard-setting body rather than a science partner (Gray, 1998, 2003; Kahn, 1999). A more decentralized network during translation, dissemination, and public access-related activities reinforced the Agency's role as a science partner rather than a regulator.

**Distribution of money to EPC contractors and effectiveness.** Attention next turns to the possible association between the number of times the EPC office's distributed funds to the EPC contractors and translation, dissemination and accessibility effectiveness. I hypothesized that a more centralized network in which the actors of Program I worked would be associated with higher levels of effectiveness.

***1. Translation effectiveness***. The direction of one of the three possible relationships between the EPC offices' distribution of funds to the EPC contractors and translation effectiveness as measured by the number of evidence report translations supported my proposition (see Table 26). A decentralized network was associated with lower numbers of partner translations (65 of the 191 total translations).

Yet as network centralization decreases (distribution of funds to EPC contractors), translations by EPCs and for Program I as a whole increased, the opposite of what I predicted. Again, these results may be attributed to the nature of the EPCs, which regularly published the findings of systematic reviews in the form of journal articles regardless of being under contract to AHRQ.

When attention turns to the distribution of funds relating to translation-related activities and the number of months it took to translate evidence reports, none of the three possible

relationships examined supports my prediction. Lower numbers of network translation activities organized were associated with higher levels of translation effectiveness as tapped by the time taken to translation (see Table 26). The results suggest that the decentralized network in the distribution of funds to the EPC contractors is associated with relatively higher levels of translation effectiveness.

***2. Dissemination effectiveness***. Next I examined the relationship between funds distributed to EPC contractors by the EPC office that related to dissemination and links to products; none of the three possible relationships supported my prediction (see Table 26). As network centralization decreased, partner, EPC and Program I dissemination effectiveness increased.

***3. Accessibility effectiveness.*** However, when examining the relationship between network centralization and the three types of free online access to products, all nine of the possible associations for Program I, the partner entities and the EPC organizations are positive as hypothesized.

**Summary.** Although I found relatively little overall support for my hypothesis, 20 (56%) of the 36 total possible relationships explored were consistent with my expectations. The results suggest an association between a decentralized network and lower translation effectiveness as tapped by fewer partner-authored translations, as predicted.

Yet a decentralized network also was associated with more EPC evidence report translations and total translations. Centralization also was negatively related to translations effectiveness measured by the time it took the partners, EPCs, and Program I as a whole to translate an evidence report. In addition, a less centralized network was related to greater numbers of links to partner, EPC and Program I total products. Other factors, including that the

EPCs are well regarded for the articles that their faculty author on the findings from systematic reviews, might be better indicators of translation effectiveness during Program I. Additionally, variables such as the partners sponsoring at least one peer-reviewed medical journal and database also might better explain dissemination effectiveness as tapped by the numbers of links to products. Yet less network centralization also was related to lower access effectiveness for the partners', EPCs', and Program I's total as predicted. Moreover, had the EPC office coordinated the steps needed for accessibility effectiveness among the network actors, such centralization could have led to greater accessibility effectiveness as measured by the number of free publicly accessible online products.

**Network Complexity**

Hypothesis 2 predicts a negative association between network complexity and program effectiveness. I first present the findings from statistical analysis of the possible relationships between the numbers of partners, regions, sectors, and levels (national, state, local) among the network actors that worked on a selected topic and Program I's effectiveness. Then I discuss the results from a somewhat more qualitative examination of the possible relationships between effectiveness and whether the EPCs used their collaborative components and the number of advisory and peer-review panel members for each selected topic.[76]

**Number of partners.** The first measure of a complex network is the number of partners that worked on a selected evidence-based topic ("number of partners" hereafter).

[76] Since data gathered on whether the EPC used its collaborative component and the number of advisory and peer-review panel members across each topic were limited and indicated little if any variation across the topics, both were treated as factors rather than variables. I conducted qualitative analysis including pattern matching among work documents and interviews statements to explore the possible relationships between whether the EPC used its collaborative component, and translation, dissemination and accessibility effectiveness and to examine the possible association between the number of panel members and translation, dissemination and accessibility effectiveness.

***1. <u>Translation effectiveness</u>***. I examined the possible relationships between the numbers of partners and evidence report translations for all of Program I and for the partner and EPC organizations. Two of the three possible relationships between the numbers of partners and the number of evidence report translations were statistically significant.[77] However, the direction of the relationships is positive rather than negative—the opposite of what I predicted.

The association between the number of partners and the total number of evidence report translations in Program I did not occur by chance ($p = .003$). As the number of partners increased, the number of translations also increased (see Table 27). This is inconsistent with Hypothesis 2, but it is an important finding. Knowing the number of partners that worked on a selected topic increased one's ability to predict the number of translated evidence reports by 38.1%, compared to not knowing.

(Table 27 about here.)

Only slight differences are seen between partner organizations and EPC entities on the number of evidence reports that were translated into products. For the partners, the relationship between number of partners and numbers of translations comes close to being statistically significant ($p = .13$). Again the relationship is positive.

In contrast, the relationship between the numbers of partners and of evidence reports translated by EPCs did reach the statistical significance threshold ($p = .011$) and was notably stronger (Somers' $d = .342$). This result may be attributed to the partner entities sponsoring the journals and the databases in which partner and EPC products were published. Therefore, the more partners working on a selected evidence-based topic, the greater the opportunity for the EPC to publish the products it authored in peer-reviewed journals.

[77] Because this is an exploratory study, the indicators are mostly unused by others, and the number of cases is somewhat small, I chose to examine the statistical significance of relationships between the variables at the 90% confidence level ($p < .10$).

When turning attention to the relationship between number of partners and the number of months it took to translate evidence reports, none of the possible relationships is statistically significant (see Table 27). I speculate this result may be explained by partner entities and EPC organizations having translated the evidence reports without working together.[78] Thus, the number of partner entities that worked on an evidence-based topic during Program I evidently is not related to the time taken to translate an evidence report into a product. For topics with one partner, time to translation took a mean of 12.99 months and a median of 11 months. Similarly, topics with more than one partner took a mean of 11.35 months with a median of 12.5 months (see Appendix J).

***2. Dissemination effectiveness.*** Attention turns next to dissemination effectiveness, looking first at the relationships between number of partners and links to the derivative products generated from the evidence reports ("links to products" hereafter) for the Program I total, partners, and EPC organizations. Each of the three possible relationships is statistically significant (see Table 28). In addition, the relationships are moderately strong, but again they are in the opposite direction than I hypothesized.

The relationship between the numbers of partners and links to EPC products is notably strong. Knowing the number of partners improves one's ability to predict the number of links by more than 51% compared to not knowing. Again, I speculate that these three positive relationships could be attributed to the partner organizations sponsoring the journals and databases in which the products were published. When looking across the findings on the

[78] Clinical practice guidelines, for example, were authored by the medical association's committee. The committee's name along with the individual committee members were provided in the published product. Similarly, journal articles published the names of each EPC staff member who authored the product. As Chapter Five discussed, evidence report translations that were authored by medical association committee members typically were products that could be applied to everyday medical practice (e.g. guidelines). Translating the evidence reports into guidelines, for example, may have required a different type of expertise than may have been needed to author a peer-reviewed article for a medical journal. If so, such differences could help explain why the EPCs might not have assisted the partner organizations in translating the evidence reports during Program I.

number of partners and links to products, one sees considerable variation. The median number of links ranged from 8 (for partners) to 27 (for EPCs and the program as a whole). Yet the median number of links for program topics with more than one partner ranged from 19 (for partners) to 114 (for the program total). For Program I as a whole, the median number of links ranges from 10 (for partners) to 40 (for the total), notably fewer links than the number of links to topics with more than one partner (see Appendix K).[79] As the number of partners working on an evidence-based topic increased, the number of links to the products also increased, suggesting higher levels of dissemination effectiveness.

(Table 28 about here.)

***3. Accessibility effectiveness.*** When one examines the relationships between the number of partners and access to free online products (immediately, after six months, or after one year), none of the nine possible relationships was statistically significant (see Table 29). There is no support for my prediction.

(Table 29 about here.)

**Number of regions.** The second measure of network complexity is the numbers of geographic regions represented by the organizations that worked on a selected evidence-based topic. None of the relationships between the number of regions and translations of evidence reports for Program I, partner organizations or the EPC entities was statistically significant (see Table 30). Hence, there is no support for the hypothesis. Instead, as discussed above, the number of partners that worked on a selected topic likely is a better predictor of translation effectiveness as tapped by the number of products generated during Program I.

[79] These findings on dissemination effectiveness are worth noting because they were not reported in Chapter Five, which discusses only the findings on the dependent variables.

When attention turns to the relationships between the number of regions and the time it took to translate evidence reports, two of the three relationships are statistically significant. In addition, as predicted, all three relationships are positive. The overall relationship between complexity tapped by number of regions and translation time was relatively strong (Somers' d = .518). Knowing the number of regions among the network

(Table 30 about here.)

actors that worked on a selected topic increases the ability to predict the number of months it took during Program I to translate evidence reports by more than 51% compared to not knowing. When one region is represented by organizations that worked on a selected topic, the mean time to translation was 2.67 months (median = 4.5), compared to a mean of 13.5 months (median = 14) when organizations represented more than one region (see Appendix L).

Further, interesting differences appear between the entities that worked on translating the evidence reports for the EPC Program. The relationship between the number of regions and time taken to translation is statistically significant for partner entities, but not for the EPC organizations. Knowing the number of regions that worked on a selected topic increases one's ability to predict the number of months partners took to translate evidence reports by nearly 70% (Somers' d = .68).

I attribute this result to the nature of the products that the partner entities typically generated from the evidence reports — products pertaining to the treatment of patients in everyday health service delivery such as clinical practice guidelines and reimbursement policies. When partner entities worked on a selected topic with organizations that were located in more than one region, they may have confronted increased difficulty in conceptualizing how the evidence report applied to everyday health care delivery. When organizations working on a topic

were in one region, it took partner entities an average of 6.25 months (median = 4.5) *before* the evidence reports were completed to translate the evidence reports compared to a mean of 15.06 months (median = 13) when the organizations working on a topic represented more than one region (see Appendix L).

***2. Dissemination effectiveness.*** When attention turns to the number of regions and the number of links to products, none of the three possible relationships with dissemination effectiveness is statistically significant. These results may suggest that the number of partners for each topic is a better predictor of the number of links to products. As discussed above, the partner organizations from Program I published and disseminated the products in the journals and databases they supported. As the number of partners increased, the number of links also appears to have increased, regardless of the number of regions represented among the organizations that worked on the topic (see Table 31).

(Table 31 about here.)

***3. Accessibility effectiveness.*** Some statistically significant relationships do appear, however, when one examines the links between numbers of regions and access to free online products (see Table 32). Three of the nine relationships are significant, but they are in the opposite direction than hypothesized. All of the statistically significant relationships appear between the number of regions and access to products authored by partner organizations. None, however, is very strong, with Somers' d's, ranging from .146 to .171 for access after six months and after one year, respectively. This result could reflect the existence of greater resources when pooled among multiple regions. In some instances, more regions represented among the organizations that worked on a selected evidence-based topic could have given the partner organizations more options to provide free online access to the products they authored.

(Table 32 about here.)

When the entities that worked on the topic all came from the same region, the number of partner-authored products remained the same across the access types: four (67%) of the six partner products were free online immediately, six months after, and one year after publication. Yet when more than one region is represented, 49 (83%) of the 59 partner products were free online immediately, and 51 (86%) of these 59 partner products were accessible online six months after publication and one year after publication (see Appendix M).

**Number of sectors.** The third measure of network complexity is the number of sectors among the organizations that worked on a selected topic ("number of sectors" hereafter).

***1. Translation effectiveness***. Here, one of the three possible relationships between this indicator of complexity and the number of topics translated reached statistical significance, though the others are very close. The direction of the relationships, however, was opposite to what I predicted. As the number of sectors increased, the number of total evidence report translations also increased ($p = .097$; Somers' $d = .299$). This may indicate that knowledge of applications for translating the evidence into products increased (was greater) as the number of sectors represented by the organizations that worked on the topic increased. Public sector organizations working on the topic may have been more knowledgeable about translating the evidence report into a reimbursement policy or an article for a specific type of journal; meanwhile, private sector organizations could have been more familiar with translating the evidence report into a clinical practice guideline. Such knowledge from public and private organizations working on a selected topic then could have produced more translations of evidence reports.

For example, when the organizations working on a single topic all came from the same sector, 11 topics were translated into 14 products (translation per topic ratio of 1.273) (see Appendix N). Yet, when organizations from more than one sector worked on a topic, they converted 82 topics into 177 products (ratio = 2.159), nearly twice as many topics to product conversions.

At least during Program I, knowing the number of sectors represented among the organizations that worked on a topic increased one's ability to predict the total number of translations of evidence reports by nearly 30% (see Table 33). This suggests that if the goal is to increase the number of translations for each selected topic, it may well make sense to work with organizations from multiple sectors.

Similarly, when examining the relationship between number of sectors and the time taken to translate the evidence reports, one of the three relationships tested reached statistical significance. The direction of that relationship is negative, the opposite of the hypothesis. The relationship between the number of sectors and the time to translation for Program I as a whole was statistically significant ($p = .096$) and rather strong (Somers' $d = -.504$). As the number of sectors involved increased, the time it took to translate the evidence reports decreased; knowing the number of sectors among the organizations that worked on the topic increased one's ability to predict the time taken to translation by more than 50%. All topics selected for funding included at least one entity from the public sector — AHRQ's EPC office; that is, reports were translated either by organizations that were all in the public sector or by a combination of a public and non-profit entities. Organizations from the public sector that worked on selected topics may have required more approvals for the translations of the evidence report prior to submitting a final product for publication. Waiting for such approval could have increased the number of months

taken to translate the evidence reports in the public sector. However, when organizations from the private sector worked on a selected topic, such organizations may well have needed fewer

(Table 33 about here.)

authorizations on the translations they authored prior to submitting the products for publication. Although AHRQ's EPC office was involved in each topic, if the translation was generated by another organization in the public sector, it also may have required its own internal authorizations prior to submitting the product for publication, which very well could have added more time taken to translation.

The total time for translation by public sector organizations was a mean of 19.75 months (median = 22) compared to translation by organizations from more than sector, which took a mean of 11.97 months (median = 11) (see Appendix O). Since the average time taken to translation during Program I was 12.47 months, this difference of slightly more than eight months is considerable.

***2. Dissemination effectiveness***. When attention turns to dissemination effectiveness, examining the relationships between the number of sectors and the links to products, none of the three possible relationships reached statistical significance (see Table 34). The hypotheses are rejected.

(Table 34 about here.)

***3. Accessibility effectiveness***. Much the same is true for accessibility effectiveness when examining the relationships between the number of sectors and provision of free online access to the products generated. I attribute these results to partners routinely disseminating the products generated in the journals and databases regardless of the number of sectors that worked on the

topic (see Table 35). As for free online access to products, both public and private sector partner organizations typically provided

(Table 35 about here.)

free access to the products they authored immediately after publication. In contrast, both public and private sector products authored by the EPC entities typically were not accessible online for free access immediately or after six or 12 months.[80]

The number of sectors involved, then, appears not to be a useful predictor of access to products. Other variables may better explain access effectiveness.

**Number of levels.** One such variable may be the number of levels of government (federal, state, or local) represented among the organizations that worked on a topic ("number of levels" hereafter), the fourth measure of network complexity. During Program I, AHRQ's EPC office, at the national level, was represented in every selected evidence-based topic. As the number of levels increased for the topic, the number of entities that represented the state or local levels also increased. Organizations at the local level worked on only three selected topics during Program I (see Appendix P). This might be explained by their being fewer technical resources at the local level available to develop the evidence reports, translate the reports into products, and disseminate and provide access to the products.

***1. Translation effectiveness***. When one examines this indicator's links to the number of evidence report translations, none of the three possible relationships is statistically significant

[80] As discussed earlier, the nature of the products authored by the partner organizations and EPC entities may account for the differences in accessibility. Partner typically authored products in the form of clinical practice guidelines and reimbursement policies. These products were accessible online for free immediately after publication. However, products in the form of journal articles most often were authored by the EPC organizations, and public access to the articles generally required a monetary fee across the three access types (immediately after publication, six months after publication, and one year after publication). Since EPCs authored 126 of the 191 total products generated during the Program I, this had a direct impact on access effectiveness.

(see Table 36). Nor is number of levels evidently related to the time it took to translate the evidence reports into products.

(Table 36 about here.)

***2. Dissemination effectiveness.*** A similar picture appears when attention turns to dissemination effectiveness, examining the relationships between number of levels and links to products (see Table 37). None of the three possible relationships tested reached statistical significance.

(Table 37 about here.)

***3. Access effectiveness.*** Yet when examining the relationship between the number of levels and the availability of free online products, four of the nine possible relationships are statistically significant (see Table 38). In addition, the direction of the relationships is as my hypotheses predicted. The negative relationships could reflect that the organizations that worked on the topics at the state or local levels had fewer resources available to support journals and databases that provided free access to products.

More specifically, the relationship between the numbers of levels among the organizations that worked on a selected topic and free immediate access to Program I's products was statistically significant ($p = .002$) and of moderate strength (Somers' $d = -.288$). Similarly, the relationship for partners was statistically significant and fairly strong. In both, fewer levels was associated with more immediate access to free products. Thirty-eight of the 42 partner products (90%) were accessible immediately after publication when there was one level among the entities that worked on the topic; 15 of the 23 partner products (65%) generated for topics in which there was more than one level were available immediately upon publication. Forty-eight of the 116 (41%) total products were available immediately after publication when organizations

at the national level that worked on the topic, and eighteen of the 75 total products (24%) with more than one level were available immediately (see Appendix P).

(Table 38 about here.)

Much the same appears when one considers free accessibility effectiveness after six months. The relationship between number of levels and accessibility is negative, and it is statistically significant for Program I as a whole and for the partners. For access after 12 months, the only statistically significant relationship between number of levels and free accessibility is for partners. These results might be attributed to partner organizations having direct knowledge of the journals and databases they supported that provided free online access to products six months and one year after publication, and the partners submitting their products for publication to these journals and databases. At least as important, the majority of the partner translations were clinical practice guidelines, which typically are accessible to the public for free.

**EPC collaborative component.** The fifth measure of network complexity is whether the EPCs used their collaborative components for each of the 93 topics. It will be recalled that an EPC collaborative component was comprised of various clinics, hospitals, and health policy organizations that each EPC identified at the outset of Program I as being available to work with the EPC on an evidence report when the EPC thought additional expertise was needed.

EPC collaborative components were used to draft evidence reports for only four (4%) of selected topics — twice in 1997 and twice in 1998. The four topics were in three clinical categories, including “Traumatic Brain Injury” and “Urinary Complications Paralyzed Persons,” both in the Neurology category; “Prevention of Venous Thromboembolism” in the Cardiovascular category; and “Acute Otitis Media” in the Otolaryngology, Respiratory and Allergic category. All four topics were selected for funding in the first two years of Program I

and were drafted by three distinct EPCs with different partners from multiple sectors. The organizations that worked on the topics took slightly longer than the mean of 22 months to generate an evidence report for the selected topic.

All seven of the EPC staff interviewed reported that EPCs using their collaborative components to develop evidence reports was complicated by the need to coordinate conference calls that fit into the participants' schedules (2005). Conference call participants included EPC staff members who worked on the evidence report, one to two individuals from the partner organization, eight to ten advisory panel members, and a task order officer from AHRQ.

When the work shifted from generating the evidence reports to translating the reports, however, the EPCs also used their collaborative components (Interview Statements, 2005). AHRQ did not require that the EPC conduct conference calls with members of the collaboration team after the report was generated (Interview Statements, 2005). I infer that the EPCs gained technical expertise in evidence report translation by using their collaborative components. Yet including the collaborative component with more actors spread across different locations translating the evidence report increased the degree of complexity in the network.

**EPC collaborative component and effectiveness**. Next attention turns to the possible relationships between the EPCs using their collaborative components and translation, dissemination, and accessibility effectiveness.

***1. Translation effectiveness.*** One of the three possible relationships examined between the EPC using its collaborative component and the number of evidence report translations supports my hypothesis (see Table 39). As network complexity increased, the number of evidence report translations (65 of the 191) authored by the partner organizations decreased.

Yet the reverse is found examining the possible association between the EPC using its collaborative component and the EPCs' total and Program I's total translations EPCs translations 126 of the 191 Program I total translations. These results may reflect the technical expertise of the EPCs working with their collaborative components.

When attention turns to the association between an EPC using its collaborative component and the number of months it took to translate the evidence reports, none of the possible relationships supports my hypotheses. An EPC's use of its collaborative component was associated with greater effectiveness. As suggested above, the EPCs using their collaborative components may well have served to increase their expertise in translation and therefore decreased the time taken to translation.

***2. Dissemination effectiveness.*** None of the three possible relationships between the EPCs using their collaborative component and the number of links to the partner and EPC entities, and Program I's total products supported my hypotheses (see Table 39). The EPCs using their collaborative component is positively associated with higher dissemination effectiveness as tapped by the number of links to products. Since many of the partner organizations sponsored at least one journal in which the products were published, this most likely increased the partners' and the EPCs' opportunities for disseminating their products.

***3. Accessibility effectiveness.*** When one examines the possible relationships between the EPCs using their collaborative component and free online access to the products, nine of the possible relationships provided some support for my hypotheses (see Table 39). As the EPCs' use of their collaborative components increased, the number of free online products decreased. Although the journal that published or posted Program I's products on its website ultimately determined whether products would be accessible to the public without a fee, I speculate that

these results might be better explained by the decentralized network that the Program I actors operated in. Moreover, had the EPC office coordinated the steps needed for accessibility effectiveness as discussed earlier, this greater centralization could have led to higher accessibility effectiveness with more free publicly accessible online products.

**Number of advisory and peer-review panel members.** The final measure of network complexity is the number of advisory and peer-review panel members working on an evidence report. Such panels were to consist of eight to ten individuals, each with members who came from a wide variety of organizations including hospitals, laboratories, managed care, medical associations and societies, and federal agencies. The greater the number of panel members, the higher the level of network complexity.

Earlier chapters noted that individual members from health care consumer groups (e.g., patient advocates) initially were slated to be included on the advisory panel for each selected evidence-based topic during EPC Program I (Background Information, 2005, 2006). Reportedly, however, some individuals from the Program office and the partner and EPC entities thought that including persons from health care consumer groups on the advisory panels "would make the process [of developing the evidence-based topics] too complicated" (Ibid.). Programs II and III continued to exclude consumer representatives from the advisory group panels (Background Information, 2006; Document Review, 2010).

Panels consisted of 10 members for the majority of the 93 selected topics (Interview Statements, 2005; Background Information, 2006). This suggests a fairly high degree of network complexity among the actors who worked on the selected evidence-based topics.

**Number of panel members and effectiveness**. Attention turns next to the relationships between a greater degree of network complexity as tapped by the number of advisory and peer-review panel members for selected evidence-based topics and effectiveness.[81]

***1. Translation effectiveness.*** Only one of the three possible relationships between the number of panel members and the number of evidence report translations supports my prediction (see Table 39). Higher network complexity is associated with a somewhat lower number of partner translations. Specifically, had individual members from health care consumer groups been included on advisory panels, topics might have been refined in ways that more directly represented physicians' everyday patient population.[82] Such topics could have led to more products generated by the partner entities.[83] However, as the number of panel members increased the number of EPC and Program I translations also increased, the opposite of what I predicted. As I discussed earlier in the network centralization section, these results may be attributed to the nature

of the EPC entities in authoring published summaries of systematic reviews regardless of whether AHRQ contracted with these entities.

When attention turns to the relationships between number of panel members and the time it took to translate the evidence reports, none of the possible relationships supports my hypotheses. A higher degree of network complexity is associated with somewhat higher translation effectiveness: as the number of panel members increased, translation took less time. Again, these results may be explained by the partners and EPCs working independently in

[81] Since the number of advisory and peer-review panel members for a selected topic is a factor rather than a variable, for the purpose of clarity the results from exploring its possible relationship between this factor and each dimension of program effectiveness appear in a separate table (Table 39) instead of the previous table that includes the results from the preceding explanatory variables and effectiveness.

[82] The data used for evidence reports primarily come from clinical trials. Clinical trials include subjects that typically do not represent physicians' everyday patient population.

[83] Partner entities usually generated products that applied directly to the treatment of patients in everyday health care delivery such as clinical practice guidelines and reimbursement policies.

generating the evidence report, in effect decreasing network complexity and resulting in less time spent on interaction with other program actors.

***2. Dissemination effectiveness.*** When one examines the possible association between the number of advisory and peer-review panel members and the number of links to products, none of the three possible relationships supported my prediction (see Table 39). Higher network complexity tapped by the number of panel members is positively associated with the numbers of links to the partners', EPCs' and Program I's total products. Regardless of increased network complexity as measured by the number of panel members, since nearly every Program I partner sponsored at least one peer-reviewed journal, this most likely increased the partners' and the EPCs' opportunities for disseminating their products. Thus, the nature of the partners that were involved in Program I may be a better predictor of the number of links to the program's products.

***3. Accessibility effectiveness.*** All six of the possible relationships between the number of panel members and the extent of free on-line access support my predictions (see Table 39). As the number of advisory and peer-review panel members increased, accessibility effectiveness decreased. As mentioned, I speculate that the decentralized network in which Program I actors operated might better explain these results. Again, if the EPC office had coordinated the steps needed for accessibility effectiveness, this could have led to higher accessibility effectiveness.

**Summary.** Examining the relationships between the six measures of network complexity and program effectiveness produced some support for the initial hypotheses. Analysis yielded several statistically significant relationships between effectiveness and four of the six measures network complexity measures (numbers of partners per topic, numbers of regions among the network entities that worked on a topic, numbers of sectors represented by the organizations that work on a topic, and the number of levels of the Program I entities that worked on selected

evidence-based topics). Network complexity measures were positively related to some indicators of EPC Program I's effectiveness, yet negatively associated with others. Seven (50%) of the 14 statistically significant relationships were consistent with my predictions (see Table 39).

(Table 39 about here.)

Having more than one partner working on a selected evidence-based topic was associated with greater numbers of EPC-authored products and total products during Program I. The number of partners that worked on a topic also was positively associated with the numbers of links to partners', EPCs', and Program I's total products.

Moreover, knowing the number of partners might help one to predict translation and dissemination effectiveness, but it would not be as useful in predicting accessibility effectiveness. Instead, the number of levels represented among the entities that worked on the topic, at least during Program I, was a better predictor. As hypothesized, the number of levels was negatively associated with the numbers of free online products accessible immediately upon publication for partner authored products and for Program I as a whole. Also as predicted, the number of levels was negatively related to the numbers of fully accessible online products six months after publication for partner-authored products and for Program I total products. Further, as predicted, the number of levels also was negatively associated with the numbers of freely accessible online products one year after publication for partner authored products.

More sectors represented by entities that worked on a topic was associated with higher levels of effectiveness as measured by the total number of products generated and the time taken to translate a report into a product. Both relationships were in the opposite direction of predictions. Yet, as hypothesized, having more regions represented among the organizations that

worked on a topic was positively related to the amount of time taken to translate reports into products for Program I overall.

In addition, the more advisory panel members that worked on the selected topics, the fewer the number of partner-authored products. At the same time, knowing that Program I excluded individual members from health care consumer groups on advisory panels for evidence-based topics could help explain the relatively low number of products generated by the partner entities.

Thus, mixed support is found for Hypothesis 2.

**Strength of Ties**

Hypothesis 3 expects a positive relationship between strength of ties among Program I's actors and program effectiveness. Seven indicators measured tie strength between entities in the EPC Program I network. More than half of the possible relationships explored support my expectations.

**EPCs that referenced other network entities' work**. I first measured weak ties by how often a Program I author referenced or quoted another EPC's or partner's work. The less frequently an author in Program I referenced or quoted another EPC or partner's work, the weaker the ties between the network actors.

All seven EPC staff members interviewed stated that they did not reference other EPCs' or partners' work when drafting or translating evidence reports during Program I.[84] Two of the

[84] The findings from examining evidence reports and derivative products generated during Program I also indicate that the EPC authors did not reference other program actors' work. I examined the references of the 65 total partner translations (products) from Program I. The majority of the partner translations cited AHRQ as the product's funding source. Each partner translation also included AHRQ's publication number and the title of the evidence report from which the product was derived in a citation in the references section of the translation.

seven added that EPCs might begin referencing other EPCs' work in Program II because the evidence reports require verification of possible needed updates every five years.[85]

When asked about EPCs referencing partners' work, one of the seven interviewees suggested that if the EPCs had had more interaction with the partners, it could have helped the EPCs "understand why they did not like our findings in the evidence reports," which then might have led to more EPC referencing of the partners' work. According to this respondent, AHRQ did not encourage EPC staff members to interact more frequently with the partners in activities including referencing Program I's partners' or panel members' publications because less interaction allowed the EPCs greater objectivity in developing evidence reports and in translating the findings. EPC staff members' rare referencing of other Program I authors' work indicates relatively weak ties between the actors who worked in the program's network.

**EPCs that referenced other network actors' work and effectiveness**. I explored the possible relationships between the number of times that the EPCs referenced other program actors' work and translation, dissemination and access effectiveness for all of Program I and the partner and EPC organizations.

***1***. ***Translation effectiveness.*** Looking at the prospective associations between the numbers of times the EPCs referenced other network actors' work, one of the three possible associations examined supported my prediction (see Table 40). The result suggests that EPCs' rare referencing other network actors' work in Program I was associated with lower translation effectiveness as tapped by the number of partner-translations, as predicted.

A different picture emerges when one examines the possible relationship between the frequency with which the EPCs referenced other actors' work and the total program and EPC-

[85] I reviewed the evidence reports generated during Program II and found many updated reports from Program I. Also, each updated report referenced the original evidence report (e.g. "Diagnosis and Treatment of Attention Deficit Hyperactivity Disorder in Children").

authored translations. Weak ties are associated with higher numbers of Program I total products (191) and EPC authored-products (126). Yet, these results may be better explained by the EPCs' faculty authoring published summaries of systematic reviews (evidence reports) regardless of whether the work was under contract to AHRQ. Also, since the EPCs authored the majority of products generated during Program I, these entities had a direct impact on the program's translation effectiveness. Thus, the nature of the EPC organizations was a better predictor of translation effectiveness, at least for Program I.

When attention turns to the possible relationship between weak ties tapped by the number of times the EPCs referenced other Program I actors' work and the time taken to translation, none of the potential relationships explored support my prediction (see Table 40). Instead the results suggest that weak ties are associated with less time taken to translate an evidence report into a product.[86] I speculate that the higher levels of translation effectiveness as tapped by the time taken for translation might be explained by partner entities and EPC organizations translating the evidence reports without working together. Moreover, knowing that program actors may *not* work with one another to identify links between the findings of the evidence reports (which typically represent a test subject population) and physicians' treating the everyday patient population could point to faster time taken to translation.

(Table 40 about here.)

***2. <u>Dissemination effectiveness</u>***. None of the three possible relationships explored between the EPCs' referencing other actors' work and the number of links to products support my predictions (see Table 40). The results suggest a negative association between strength of ties and dissemination effectiveness in the numbers of links to products. While the number of times

[86] As mentioned, it took a mean of 12.47 months (median = 11 months) from completion of the report to publication of the product for Program I overall, a mean of 12.69 months (median = 11.5 months) for partners, and a mean of 10.91 months (median = 10 months) for the EPCs.

the EPCs referenced other actors' work was infrequent, the number of links to products increased. As mentioned, since the partner entities sponsored the periodicals and databases in which many of the program products were published, this may have provided the partners and EPCs with more opportunities for disseminating the products they authored.

***3. Accessibility effectiveness***. Yet when examining possible relationship between the number of times the EPCs referenced other Program I actors' work and accessibility effectiveness, the results for all three of the relationships support my hypotheses (see Table 41). The EPCs infrequent referencing of other Program I actors' work is associated with lower levels of accessibility effectiveness. However, as discussed, knowing the extent of network centralization in coordinating the steps related to providing free online access to products may be a better predictor of accessibility effectiveness than the strength of ties.

**Familiarity with EBM methodology**. The second measure of strength of ties is the extent of familiarity with EBM methodology among the actors that operated in Program I's network: the less familiar the actors were with EBM methodology, the weaker the ties that connected the network actors. All four of the EPC staffers interviewed noted that each EPC principal investigator and a key staff person attended a training program on EBM methodology when Program I began. Three of the EPCs provided such training.[87] Respondents from two of the three EPCs also noted that the faculty and staff from the 12 EPCs were EBM experts and that each made contributions to the field.[88]

All seven of the EPC staff persons interviewed observed that partners that were units in HHS were more familiar with EBM methodology than the partners of non-HHS units. I attribute

[87] EPC "W," one of the three EPCs offering an EBM methodology training program, is a forerunner in the field of EBM. The four EPC respondents also noted that the remaining two EPCs ("V" and "Q") that offer such training are highly regarded in teaching EBM methodology and that the staffers learned a great deal from them.

[88] Two respondents offered examples of the individual expertise of EPCs that were not EBM training centers. Such instances included software for rating evidence (EPC "S") and templates for rating the evidence (EPC "A").

these statements to the goals and work activities that the respondents shared with many of the HHS staff members including the use of scientifically rigorous methods to rate the quality of medical studies.[89] Partners that represented units of HHS included AHRQ, CMS, and NIH, and professional medical associations usually represented non-HHS partners.

The goals and daily work activities of non-HHS partners typically involved delivering everyday health care using best practices that applied to the "ordinary" patient population.[90] During Program I, such partners generated far fewer products than the EPCs, However, the former organizations typically translated the reports into clinical practice guidelines, the type of product that Congress designed AHRQ's EPC Program to produce and a tool that directly applies to everyday medical practice.

Looking across the topics-selected data, non-HHS units served as partners for 44 (47%) of the 93 topics, suggesting that relatively weak ties connected the Program I's network entities as measured by the extent of familiarity with EBM methodology.

**Familiarity with EBM methodology and effectiveness**. Next, I explored the possible relationship between the degree of familiarity with EBM methodology and translation, dissemination and public accessibility effectiveness.

***1. Translation effectiveness***. The results suggest that less familiarity with EBM methodology among the network actors is associated with fewer partner-authored products, as predicted (see Table 41). Evidence reports are generated using EBM methodology. Due to the nature of the products typically authored by the partner entities, translating the evidence reports

[89] Three of the four respondents elaborated that partners that were units of HHS typically were familiar with the literature on the selected topic, had refined their research questions, and had established a pre-determined group of experts to serve as members of the advisory and peer-review panels for each topic that they nominated.

[90] The "ordinary" patient population refers to patients who represent the everyday patient population, rather than the "ideal" patient population found in clinical trials. Non-HHS partners usually represented professional medical associations including the American Academy of Family Physicians, the American Academy of Pediatrics, and the American College of Physicians.

into products for use in everyday health care practice required that partners identify the links between a test-subject population typically represented in the evidence reports to a physician's everyday patient population. During the first few years of EPC Program I, the EPCs were under contract to AHRQ to assist the partners in translating the evidence reports into products to use in everyday health care delivery. Since the EPCs typically did not assist the partners in translating the evidence reports, knowing the extent of the partners' familiarity with EBM methodology can help predict the number of partner-authored products, at least during Program I.

A different picture emerges when attention turns to the possible association between familiarity with EBM methodology among the network actors and the number of EPC and total program translations. Here, results indicate that less familiarity with EBM methodology were all among the program actors is associated with more EPC-authored translations and thus overall Program I translations, the opposite of my prediction. This reflects the high degree of familiarity with EBM methodology among the EPCs' faculty and staff members. Although the EPC entities represented less than 10% (12 of the 156) of the program's actors, they authored 66% (126 of the 191) of Program I's total translations.

Next I explored the possible relationship between the actors' familiarity with EBM methodology the number of months taken to translate the evidence reports; none of the relationships support my prediction. Less familiarity with EBM methodology among the network actors is related to less time taken to translate evidence reports. As discussed earlier, these findings indicate that the network actors possibly translated the reports without working together on the translations, which very well may help explain the higher levels of effectiveness.

***2. Dissemination effectiveness***. Attention turns next to examining the possible relationship between differing philosophical orientations and dissemination effectiveness as

tapped by the number of links to products. None of the possible relationships explored was consistent with my predictions. The results suggest that general lack of familiarity with EBM methodology among the network actors is associated with higher degrees of dissemination effectiveness. As noted above, partners' and EPCs' opportunities for disseminating their products likely were numerous because nearly every partner sponsored at least one peer-reviewed journal that typically included a database. Moreover, the nature of the partner entities that worked in the EPC Program I network may better predict the number of overall links to products.

***3. Accessibility effectiveness***. However, less familiarity with EBM methodology among the actors that operated in the Program I network is associated with low levels of accessibility effectiveness as measured by the number of publicly accessible free online products. If the Program I entities had facilitated greater familiarity with EBM methodology among the non-HHS entities in a manner that linked the topics and research questions directly to physicians' patient populations, such familiarity might have led to more partner authored-products. Since the partner entities typically generated publicly accessible free online products, a greater number of partner-authored products, then, could have led to a higher degree of accessibility effectiveness.

**Varying philosophical orientations**. A third measure of tie strength was the degree of differing philosophical orientations among the entities involved in Program I. A high degree of variation in professional orientation signaled weaker ties among the actors that operated in the program network. Six of the seven interviewees stated that the philosophical orientations among the Program's network actors differed greatly, particularly on selected topics nominated by non-HHS partners. Conflicts over the interpretation of the research literature on a topic and over the literature to include in the evidence report frequently reflected these differing orientations. For

example, AHRQ decided to fund the topic "Diagnosis and Treatment of Attention Deficit and Hyperactivity Disorder in Children" during EPC Program I. While working on the literature review for the topic, individuals from the partner and EPC organizations disagreed over whether to include studies that considered counseling as intervention in treating children diagnosed with Attention Deficit and Hyperactivity Disorder (ADHD). Eventually, the EPC reportedly included this literature in the review for the evidence report. Moreover, when rating the evidence, disagreement arose over how to rate the quality of the studies. Due to their differing philosophical orientations (e.g., psychiatry compared to psychology), many of those who worked on the topic did not believe that counseling could be used as part of credible intervention to treat children who suffer from ADHD.

Debate among the network actors that stemmed from varying philosophical, orientations took a great deal of time according to three of the seven respondents; the widespread variation in orientation led to delays in framing research questions for selected topics and an overall time lag in completing the evidence reports. Such conflict also led to some partners not translating evidence reports due to lack of agreement with the findings.

These findings suggest a relatively high degree of philosophical differences between the actors that operated in Program I's network, which signals that weak ties connected the network actors.

**Varying philosophical orientations and effectiveness**. Next, I examined the possible relationships between tie strength tapped by the extent of differing philosophical orientations and translation, dissemination and accessibility effectiveness for all of Program I and by the partner and EPC organizations. I predicted that weak ties would be associated with lower program effectiveness.

***1. Translation effectiveness.*** One of the three possible relationships explored between varying philosophical orientations among entities involved in Program I and the number of translations supported my prediction: weaker ties were associated with fewer partner translations (see Table 41).

Yet two of the possible associations between weak ties tapped by the degree of differing philosophical orientations among entities involved in Program I did not support my hypotheses. Differing philosophical orientations among the entities that worked in the Program I network were related to high degrees of translation effectiveness in the number of EPC and Program I total translations – the reverse of my prediction. Again, I attribute this result to the EPCs' publications authored by their faculty that summarize the findings of systematic reviews (evidence reports), regardless of the work being contracted by AHRQ.

Attention next turns to the possible relationship between the degree of varying philosophical orientations among entities involved in the program network and the number of months taken to translate the evidence reports. None of the possible relationships explored support my predictions (see Table 41). Weak ties connecting the actors were associated with high levels of translation effectiveness as tapped by the time taken to translation.[91]

***2. Dissemination effectiveness***. When attention turns to dissemination effectiveness, a similar picture emerges. None of the three possible relationships between varying professional orientations among the organizations that worked on the topic and the number of links to products support my predications (see Table 41). The results indicate that weak ties are associated with high levels of dissemination effectiveness.

[91] I attribute these results, as noted earlier, to the partner and EPC organizations possibly translating the evidence reports without working together on the translations. From these results, I also speculate that the differing philosophical orientations among the network actors might help explain why the partners and EPCs did not appear to work with one another to translate the evidence reports.

***3. <u>Accessibility effectiveness</u>.*** However, when examining the possible association between differing philosophical orientations among entities involved in Program I and free online access to the products, all three of the relationships examined support the hypotheses (see Table 41). The results indicate a positive relationship between strength of ties and the extent of free online access to products. Thus, weaker ties among the actors were associated with fewer products being publicly available online without a monetary fee assessed for access.

**<u>EPC staff talking with individual partner members at medical association and society conferences.</u>** Fourth, the study measured strength of ties among the network actors by the number of times an EPC staff member[92] spoke with individual partner representatives at medical association conferences.[93] The less frequently an EPC staffer talked with a partner representative from Program I at such conferences, the weaker the ties among the network actors. Four of the seven EPC staffers interviewed stated that they did *not* participate in medical society conferences. One respondent elaborated, noting that their EPC lacked time or money to attend such meetings, and instead interests focused more on completing evidence reports and submitting the findings for publication in peer-reviewed medical journals.

One of the seven respondents, however, stated that they did attend professional medical society conferences and talked to some of the individual partner representatives from Program I. Another respondent commented that after such interaction with a Program I partner-volunteer, an EPC staff member co-authored a guideline "The Use of Epoetin in Patients with Cancer." Although the small sample of respondents provides only limited evidence, the results indicate that individuals from the EPC organization were more likely to translate an evidence report into

[92] The terms, "EPC staff person," "EPC staffers," and "representatives from an EPC" are used interchangeably in this study and refer to fulltime EPC employees.

[93] The terms professional "medical association conference" and "medical society meeting" are used interchangeably. Both phrases refer to organized groups of health professionals who meet annually to present and discuss papers and ideas in areas including health care delivery practices and related health care policies.

a product in collaboration with the partner representatives *if* individuals from EPCs attended such conferences and talked with individual partner members who also worked on the evidence report with the EPC staff person. Overall, it appears that relatively few EPC staff members attended medical association conferences, suggesting that weak ties connected the actors that operated in the EPC Program I network.

**EPC staffers talking with individual partner volunteers at medical conferences and effectiveness.** I hypothesized that weak ties would be associated with lower levels of program effectiveness.

***1. Translation effectiveness***. One of the three possible relationships explored between this measure of tie strength and the numbers of translations supports my prediction (see Table 41). The results indicate that weak ties were associated with a lower number of partner authored translations, as predicted.

Yet two of the possible associations between individual EPC staffers speaking with Program I partner entity representatives at medical association conferences and translation effectiveness are in the opposite direction of the hypotheses. The results indicate that weak ties as tapped by this indicator are associated with high numbers of EPC and Program I total derivative products generated. I attribute such findings to the nature of the organizations that served as EPC entities during Program I. [94]

When attention turns to the possible relationships between how often EPC staff members talked with individuals from the partner entities at professional medical conferences and the time

[94] Again, most of the EPC organizations are well regarded for the published articles that their faculty members regularly author on the findings from systematic reviews (evidence reports) regardless of whether they were under contract by AHRQ.

taken to translate the evidence report, none of the relationships supports my predictions (see Table 41).[95]

***2. <u>Dissemination effectiveness</u>***. A somewhat similar finding emerges when attention turns to dissemination effectiveness. Results from examining the study's three possible associations between how often the EPC staff members talked with volunteers from the partner organizations at society meetings and the numbers of links to products indicate that none of the possible relationships supports my predictions (see Table 41). Weak ties were associated with higher numbers of links to products. Again, I attribute these results to the nature of Program I's partners. The partner organizations sponsored many of the journals and websites in which the Program I products were published, which could have served to increase the partners' and the EPCs' opportunities for disseminating their products.

***3. <u>Accessibility effectiveness</u>***. When attention turns the possible relationship between this measure of strength of ties and accessibility effectiveness, a different picture appears. The results indicate a positive association between strength of ties and accessibility effectiveness: weaker ties are associated with lower accessibility effectiveness, which supports my hypotheses. However, knowing the extent of network centralization in coordinating the steps related to providing free online access to products may be a better predictor accessibility effectiveness.

**<u>EPC staff speaking with staffers from other EPCs at medical association conferences and meetings.</u>** The number of times EPC staff members talked with representatives from another EPC at a medical association meeting is the fifth measure of tie strength. The less frequently EPC staffers talked with individual staff members from other EPCs at the conferences,

[95] As mentioned, analyses of these data suggest that the partner entities and EPC organizations may have translated the evidence reports without working together. I also speculate that weak ties as measured by EPC talking infrequently with other network actors at medical conferences could help explain why the partners and EPCs did not appear to work with one another to translate the evidence reports.

the weaker the ties among the network actors. Six of the seven interview respondents stated that they did not attend such meetings; therefore, they did not have the opportunity to interact with staffers from other EPCs. Although one of the seven respondents noted that staff members from their EPC were aware of staffers from other EPCs at conferences, they did not interact with them. Overall, it appears that relatively few EPC staff talked with individual representatives from other EPCs at medical association conferences, which suggests that weaker ties connected the actors that operated in the Program I network.

**EPC staffers talking with other EPC staff members at society conferences and effectiveness**. I predicted that weak ties on this measure would be associated with lower degrees of program effectiveness.

***1. Translation effectiveness.*** One of the three possible relationships explored between the number of times that EPC staffers talked with representatives from other EPCs at medical association conferences and translations supported my prediction (see Table 41). EPC staff members infrequently speaking to individuals from other EPCs at medical association and society conferences is related to lower numbers of partner-authored products. Yet, this result in part may be explained by the nature of the evidence-based topics that AHRQ chose to fund. As noted earlier, the majority of partner-authored translations were in the form of clinical practice guidelines and reimbursement policies generated during Program I. Physicians and third-party payers want and need such products to treat patients in everyday health care delivery. Unlike the test-subject population represented in most medical studies, the everyday patient population usually suffers from more than one condition (e.g., cataracts along with glaucoma; diabetes with high blood pressure). Such individuals typically are not included in these medical studies. Hence, the findings from these studies typically do not represent the everyday patient population. As has

been noted, if the EPC Program I had selected more topics that included patients in the everyday medical population, such topics could have led to more partner-authored translations.

Two of the possible associations between individual EPC staffers speaking with other EPC representatives at medical society conferences and the number of products generated did not support my expectations. The results indicate a negative relationship between strength of ties and translation effectiveness in the number of EPC (126 of the 191) and Program I (191) total translations.

When attention turns to the possible association between the numbers of times the EPC staff talked with individuals from other EPCs at medical society conferences and the time taken to translate the evidence reports, none of the possible associations supports my predictions (see Table 41).[96]

***2. Dissemination effectiveness***. Somewhat similar findings appear when dissemination effectiveness is examined. None of the three associations between how frequently the EPC staff members talked with representatives from other EPCs at society meetings and the number of links to products supports my hypotheses (see Table 41). Weak ties are associated with more links to products. Again, the partners and the EPCs likely had numerous opportunities for disseminating their products, which better explains these results.

***3. Accessibility effectiveness***. When one looks at accessibility effectiveness however, one sees a different picture. The results suggest that the EPC staffers rarely speaking with individuals from other EPCs at medical association meetings is associated with fewer numbers of free online products after publication, as predicted. Yet these results might be better explained by the decentralized network that the Program I actors operated in.

[96] This result might be explained, as noted earlier, by the partner and EPC entities translating the evidence reports without working together on the translations.

**AHRQ's EPC Directors' Conferences and EPC conferences.** Sixth, I measured strength of ties by how often EPC staffers talked with individuals from other EPC at AHRQ's EPC Directors' Conferences and EPC conferences. The less frequently the EPC members talked with other fulltime EPC staffers at these conferences, the weaker the ties that connected EPC entities. All seven interviewees reported that the EPC staff members frequently talked other EPC staffers at such conferences. This suggests stronger ties among the actors, but only among those from the 12 EPCs. The indicator did not apply to all of the organizations in Program I's network.

**AHRQ's EPC Directors' Conferences and EPC conferences and effectiveness.**

When attention turns to the relationships between this indicator of strength of ties and effectiveness, somewhat greater support for the hypothesis emerges.

***1. Translation effectiveness***. Two of the three associations explored between the number of times the EPC staff members talked with staffers from other EPC at AHRQ's EPC Directors' Conferences and EPC conferences and the number of translations support my predictions (see Table 41). Stronger ties between the EPC staffers were associated with higher translation effectiveness as tapped by the number of EPC-authored products.

Yet the results suggest a negative association between strong ties among the EPC entities and the number of partner translations, the opposite direction predicted. Stronger ties connecting the EPC actors are associated with fewer translations authored by the partner organizations (see Table 41). This result in part may be attributed to the weak ties between the non-HHS partners and the EPCs entities on the measure of familiarity with EBM methodology as already discussed.

Between this measure of strength of ties and the time taken to translate the evidence reports into products, each relationship supports my prediction. The results indicate a positive

association between strong ties among the EPC network actors and translation effectiveness (tapped by the time taken to translate an evidence report). Yet, as mentioned earlier, I speculate that higher levels of translation effectiveness as tapped by the time taken for translation might be better explained by partners and EPCs translating the evidence reports without working together.

***2. Dissemination effectiveness***. A similar picture appears when examining dissemination effectiveness. All three relationships were consistent with my predictions (see Table 41). The results suggest positive associations between the frequency that EPC staff members talked with individuals from other EPC at AHRQ's EPC Directors' Conferences and EPC conferences and the number of links to the partners', EPCs and Program I's total products.

***3. Accessibility effectiveness***. However, when examining the possible association between EPC staffers frequently talking with one another at AHRQ's EPC Directors' Conferences and EPC conferences and the three types of free online access to products, none of the possible relationships examined supports my hypotheses. Stronger ties among the actors were associated with lower accessibility effectiveness. Ultimately, the sponsor of the journal controlled access to the products it published and posted on its website. However, as discussed earlier, had the network been more centralized in sending information to the program actors about the steps needed to provide free online public access to the products very well might have led to higher accessibility effectiveness.

**Program actors talked with one another at medical conferences and meetings prior to EPC Program I**. The final indicator of strength of ties is the number of times that EPC staff members talked with individual representatives from other EPCs or partners at a medical association or a society conference prior to the inception of Program I. The fewer times the EPC staff talked with other program actors prior to Program I, the weaker the ties connecting the

network actors. All seven interviewees reported that they did not speak with other program actors at such meetings, indicating that no ties connected the network actors. Thus, I could not examine the hypotheses.

**Summary.** The study found relatively little support for Hypothesis 4. The results point to associations between Program I effectiveness and six of the seven measures of tie strength. Fifty-eight (53%) of the 108 relationships between the six measures of tie strength and program effectiveness yielded results that were consistent with my predictions. Moreover, analysis indicates that other explanatory factors including network centralization and network complexity may be more helpful in predicting dissemination and accessibility effectiveness.

The few times that EPC staffers talked with individuals from the partner organizations at medical association conferences was associated with relatively low few partner-authored products, as hypothesized. Knowing the number of times the EPC staff members attended medical association conferences and talked with individual partner members may help account for the lower number of partner translations. Yet it was less useful in predicting translation effectiveness tapped by the time taken to translate evidence reports.

Instead the extent of familiarity with EBM methodology among the network actors that worked on the topic appears to be a better predictor of the time taken to transition, at least during Program I. Less familiarity with EBM methodology among the network actors was associated with less time taken to translate evidence reports. This was in the opposite direction than I predicted.

However, weak ties as tapped by differing philosophical orientations was associated with fewer partner-authored products, as hypothesized. Knowing the extent of varying philosophical orientations among the network actors can help predict the number of evidence reports translated

into products by the partner entities. Yet, other explanatory variables such as network complexity might be better predictors of dissemination effectiveness as measured by the number of links to each product. Network centralization also might better predict accessibility effectiveness, tapped by the number of free online products.

**Funding**

Proposition 2 predicted that increases in AHRQ's annual funding would be associated with greater program effectiveness. As will be seen, the results signal a fair amount of support for the predicted relationship.

Although funding increased in each year of Program I (1997 to 2002), as noted earlier, only two of the six coordinated network activities related to pursuing translation, dissemination, and accessibility effectiveness (see Table 30). Also, the money that the Program office distributed to the EPC entities for services rendered was not directly related to the activities associated with achieving translation, dissemination, and accessibility effectiveness.

To gain additional insight into the possible relationship between AHRQ's annual funding and Program I's effectiveness, I conducted several interviews with policy elites. The administrative and research positions of six of the 16 respondents interviewed allowed them to in offer informed statements about whether and AHRQ's how funding each year might be associated with Program I's effectiveness. Three of the six respondents were from AHRQ, and the three others were from the EPC entities.

All three respondents from the Agency noted that Program I did not have the financial resources to assess EPC Program's effectiveness. Each commented that the EPC Program asked the partners and EPCs to voluntarily track and send the EPC office a list of their evidence report translations (products) and whether a program or group was using the product. However, the

interviewees reinforced one another in observing that such voluntary reports from the partners and EPCs were not optimal and provided only minimal data about the effectiveness of EPC Program I.[97]

Each of the Agency's programs submits an annual self-report on its effectiveness to fulfill the Government Performance and Results Act (GPRA) requirement (AHRQ, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009). In these self-assessments, no Agency-wide standard is used for translation, dissemination, or accessibility. In addition, programs typically choose individual instances of effectiveness to report, rather than including an effectiveness analysis for the program as a whole for the fiscal year (Ibid.).

Moreover, the data gathered in the Agency's GPRA reports support the claims that the EPC Program had insufficient financial resources to complete a full assessment of the extent of Program I's effectiveness. Therefore, AHRQ's EPC Program administrators were less likely to know where to coordinate and support activities that could have led to greater degrees of translation, dissemination, and accessibility effectiveness. These findings led me to conclude that there were lower degrees of effectiveness during Program I than Chapter Five suggested.

EPC administrative and research scientists also commented on available resources. All three EPC respondents noted that AHRQ did not provide funds for EPC staff members to attend or present papers at medical association conferences and meetings on findings from the evidence reports. As discussed earlier, the respondents elaborated that their own organizations did not have the resources to provide travel funds to staff members to attend medical conferences and meetings. This lack of financial resources for EPC staff members to attend and present papers at medical conferences could signal lower translation and dissemination effectiveness. The

[97]One of the three AHRQ respondents also noted that GPRA required the Agency to report on the Program's effectiveness, but contended that the Agency did not have the financial resources to carry out an evaluation of the program's effectiveness (Interview Statement, 2005).

information in an evidence report often is highly technical. By attending the conferences, EPC staff and partners might have had the opportunity to discuss how to translate evidence reports into products, which could have increased the number of translations that were authored by partner entities during Program I. Also, if the EPC staff members had presented papers on the findings from their translations, dissemination effectiveness could have been enhanced.

The three EPC respondents also noted that AHRQ did not provide infrastructure funds for computer networking among administrators and research scientists who worked on the evidence-based topics. The interviewees observed that funds for this type of infrastructure could have helped them to better communicate with one another about refining the evidence-based topics. Limitations in communication among the EPC staff members in developing the evidence-based topics also could have affected the work that their staff members communicated to the partners and to AHRQ's EPC office. The lack of financial resources for computer networking among the EPC organizations could have decreased the number of translated evidence reports and disseminated products.

All three of the EPC respondents stated as well that the Agency did not provide funds for EPC staff to meet with the partners in person.[98] As a result, such meetings took place via teleconference. Each respondent commented that the manner in which the topic was refined, which studies were used for the report (e.g., clinical trials, diagnostic and observational studies), and how the EPCs chose to rate the validity and reliability of these studies impacted whether the partner would translate the evidence report into a product, and subsequently also influenced whether the partner authored a product to disseminate. The interviewees noted that discussing these matters in person with the partners could have helped due the technical nature of the topics.

[98] Each respondent also noted that it was cost prohibitive for the individual EPC organizations to fund in-person meetings with individuals from the partner organizations who worked on the selected evidence-based topic.

Two of the three EPC respondents suggested that if the organization did not agree with the findings of the report, it was less likely that the individuals from the partner organization would translate the evidence report into a product.

According to both interviewees, the ultimate goal of the EPC Program was for the partner organizations to translate the evidence reports, not for the EPC entities to do the translating.[99] Partner organizations during Program I typically translated the evidence reports into products that could be directly used in the delivery of routine health care to patients, which might have had a more immediate and direct impact on the quality of everyday health care delivery.

When attention turns to the number of partner translations (65 of 191), one could speculate that if AHRQ had provided the financial resources needed for the network actors to meet in person rather than by teleconference twice for each topic, the number of translations authored by partner organizations (and Program I's total translations) could have increased. Moreover, refining an evidence-based topic, determining the scope and appropriate literature for a topic, and agreeing on how the quality of the literature should be rated are highly complex and technical. Communicating in person rather than by teleconference could have led to greater translation effectiveness in the numbers of products and the time taken to translation for both the partner and EPC organizations. Additionally, financial resources to pay for in-person meetings also could have increased dissemination effectiveness, increasing the number of links to the partner organizations' and EPC entities' products.

[99] The EPC translated evidence reports into article publications in medical journals. These articles typically summarized the findings and implications of evidence reports, which often help to inform the health services research field and the research agenda of both public and private health care organizations (Background Information, 2006). For example, at AHRQ I served on a team that used two evidence reports and the products generated from Program I to inform the Agency's research agenda on the following topics: "Healthcare Work Conditions and Patient Safety" and "Pressure Ulcers and Air-fluidized Beds for Treatment in a Home Environment" (Personal Work Experience at AHRQ, 2006). The Agency selected both topics during EPC Program I (Document Review, 2005; see Table Two).

**Summary.** The results overall signal a fair amount of support for the relationship predicted between available funds and EPC Program I's effectiveness. Moreover, the findings signal overall lower degrees of translation and dissemination effectiveness during Program I than Chapter Five suggested. The lack of EPC Program I's financial resources to conduct annual effectiveness analyses suggests lower levels of program effectiveness for Program I overall. Not having funds for staff members at the 12 EPCs to attend and present papers at medical conference on their evidence report translations, also signals lower degrees of dissemination effectiveness. Not having financial resources allocated for EPC infrastructure money for computer networking, for instance, may be related as well to lower levels of translation, dissemination, and accessibility effectiveness. Similarly, a lack of funds for the EPCs to meet partners in person to refine the research topics and the literature to include the evidence reports (throughout Program I, II, and III to date) may help explain lower levels of Program I translation, dissemination, and accessibility effectiveness.

## The Nature of Control Used by EPC Program I

Last, Proposition 3 predicts that Program I's use of catalytic control over the network actors will be associated with higher degrees of program effectiveness.[100] Three measures tapped the nature of control Program I used.

**Schedules of work drafted**. The first indicator of the nature of the control used by Program I is the number of times the EPC office drafted a schedule of work for each topic. Interview respondents reported that in nearly every instance the EPC Program office drafted

[100] "The number of topics nominated by organizations that the EPC office selected for funding" was an additional measure that I had hoped to use to examine the relationship between the nature of control used by Program I and program effectiveness (see Appendix J). However, the data that I needed from the Agency were incomplete and reportedly all that the EPC office had. Because the data needed were unavailable, I could not include the measure in the effectiveness analysis.

initial schedules of work for the 93 evidence-based topics.[101] The EPC schedules of work were based on a 12 month timeframe to coincide with the contract schedules of pay for each selected topic.[102] AHRQ's EPC office drafted a schedule of work for each topic before the EPC began conducting work on that topic.

In all but one instance, the EPCs needed more time to complete the work schedule.[103] To acquire additional time, the EPC drafted a no-cost extension request, along with a revised schedule of work and submitted them to the AHRQ EPC office.[104] Thus, collectively, the EPCs drafted as many schedules of work as the Program office. That the Program office approved the no-cost extension requests without levying penalties against the EPCs indicates that Program I used the schedules as a catalytic control.

[101] In rare instances when the EPC drafted and submitted a schedule of work on a selected topic, it had to obtain approval from the AHRQ EPC office before it commenced work on the topic. The EPCs drafted schedules of work on only a few occasions when the EPC wished to begin work on a topic and had not yet received a schedule from the EPC office (EPC J, staff person, interview, July 20, 2005; AHRQ, EPC Program staff person, background information: EPC Program I network responsibilities, August 10, 2006).

[102] As earlier chapters discussed, schedules of work were not drafted for the partner entities.

[103] As mentioned earlier, the time that it took to complete the work required in a task order contract ranged between 11 and 36 months; the mean and median were 22 months and the mode 25 months. This is important because only one of the task order contracts was finished within the 12 month task order timeframe and thus no extension was required. The topic was "Chronic Fatigue Syndrome" in the Musculoskeletal category, taking only 11 months to complete. Examples of other task orders of topics that took the least amount of time to fulfill included "Criteria to Determine Speech/Language Disorders" in the Otolaryngology, Respiratory and Allergic category and "Milk Thistle Effects on Liver Disease" in the Complimentary and Alternative Care category. Both took 14 months complete (two months after the task order deadline). At the other extreme, task orders that took more than 12 months to fulfill included 36 months for the topic "Management of Cancer Pain" in the Hematology and Oncology category; 35 months for "Treatment of Acne" in the Dermatology category; and 32 months for both the "Use of Erythropoietin in the Treatment of Anemia in Oncology" in the Hematology and Oncology category and the "Diagnosis and Treatment of Congestive Heart Failure" in the Cardiology category (Document Review: EPC topics selected; 93 evidence reports). An EPC Program I staff person suggested that when the EPCs were granted more time to fulfill the contract deliverables, they produced better evidence reports (AHRQ, EPC Program staff person, interview: number of months needed to complete an evidence report, May 11, 2005).

[104] A no-cost extension on a task order is a period of time in which the EPC did not receive any extra funds from AHRQ for additional time needed to fulfill the deliverables of a task order contract. To obtain a no-cost extension on an evidence report task order, the principal investigator at the EPC prepares a letter describing the need for additional time to complete the task order contract and schedule of work for fulfilling the contract. The no-cost extension request had to be received by AHRQ's EPC Program at least 10 days before the expiration date of the task order. Once approved by the EPC office, a no-cost extension could be granted for up to 12 months after the expiration date of the task order contract (EPC J, staff person, background information: no-cost extensions, July 20, 2005).

***EPC contract deadlines monitored***.[105] The second measure of the nature of control Program I used is the number of times that the EPC office monitored the EPCs' contract deadlines. The time for each task order contract was 12 months.[106] Based on this, in the abstract, the EPC office was supposed to monitor the EPC contract deadlines four times per contract. Fulfillment of contract deadlines were included the EPCs' quarterly reports.[107] In these reports, the EPC reported its progress on fulfilling the contract.[108] Because the EPCs typically needed twice as much time to meet the deadlines and the EPC office granted no-cost extensions, this doubled the number of times that the EPC office *should* have monitored the contract deadlines.

Interviews sought to gain further insight into the nature of control Program I used to monitor contract deadlines and the possible relationship with program effectiveness. The administrative and research positions of six of the 14 respondents allowed them to offer informed statements about the nature of control that Program I's EPC office used in overseeing these deadlines.

Five of the six respondents reported that the EPC office did not provide verbal or written feedback on the work submitted. Yet one of the six noted that the EPC office occasionally suggested that the EPC entity find one or two additional experts to serve on the advisory or peer-review panel of a selected evidence-based topic, if an office staffer thought that the panel might lack a particular area of necessary expertise.[109] This indicates the EPC office monitored at least

[105] Unlike the EPCs, the partners were volunteers. Therefore, there were no partner contract deadlines for the EPC office to monitor.
[106] AHRQ, EPC Program, staff person, background information: number of months needed to draft an evidence report, August 10, 2006; EPC J, OMB Contract, March 24, 1997.
[107] AHRQ, EPC Program, staff person, background information: number of months needed to draft an evidence report, August 10, 2006; EPC J, OMB Contract, March 24, 1997.
[108] Monitoring contracts quarterly, four times each year, is a standard typically used throughout the public and private sector.
[109] Each selected topic had an advisory panel and peer-review committee. The EPC that was assigned to develop an evidence report on the selected topic was tasked with identifying and confirming experts to serve on the advisory panel and peer-review committee. This task was tied to the first quarterly report and schedule of pay.

one contract deliverable in the first quarter of the work needed to complete an evidence report. Yet during every other quarter of work on the contract deliverables, the EPC entities seemed to have received little if any feedback from the Program office (EPC J Archive, 1997, 1998, 1999, 2000, 2001, 2002).

Drafting a dissemination plan for the derivate product of each selected topic was another EPC contract deliverable that the EPC entities were supposed to submit during the first quarter of work (Interview Statements, 2005; OMB, 1997). During Program I's first year, however, the EPC entities collectively decided that drafting the dissemination plan for each topic that it worked on "was too much work" and that the their staff members' time could be better spent elsewhere; consequently, they stopped including dissemination plans in their contract deliverables altogether by fiscal 2000 (Background Information, 2005; EPC J Archives, 1997, 1998, 1999, 2000, 2001, 2002; Interview Statements, 2005). Yet, the Program office did not withhold money from the EPCs for failing to fulfill this task (Ibid.), suggesting that the dissemination plan contract deliverable resulted in failed coercion by the EPC office over the EPC contractors. The amount of work involved in the EPCs drafting the evidence reports may have made the EPC office less likely to impose financial sanctions on entities for failing to deliver the dissemination plans. Somewhat parallel to the relationship that may have developed between Congress and AHRQ, this failure may be explained by the development of collaborative relationships between the EPC office and the 12 EPCs. They both had been operating in a similar context for relatively long time and the relationships between them may have transformed from top-down interaction to less hierarchical information sharing about the work involved to fulfill the contract deliverables.

Similarly, during the last quarter of work on the evidence-based topic the EPCs were supposed to assist the partner entity that nominated the topic in translating the completed evidence report into a product. Two of the six respondents noted that the EPCs collectively agreed that assisting the partners to translate the evidence report into a product was too much work and thus they did not fulfill this responsibility (Background Information, 2005; Interview Statements, 2005; OMB Contract, 1997).[110] Since the EPC Program office did not withhold money from the EPCs for refusing to fulfill this contract deliverable (Background Information, 2005; EPC J's archives, 1997, 1998, 1999, 2000, 2001, 2002; Interview Statement, 2005), this could indicate another instance of failed coercion by the EPC office over the 12 EPC entities.

**Required communication**. The last measure of the nature of control Program I used is the number of "pieces" of required communication from the partner entities and the EPC organizations. Required communication included verbal and written contacts. A verbal contact was one piece of communication primarily conveyed through teleconferencing, and a written contact was one piece of correspondence that usually was submitted through e-mail.

***1. Required partner correspondence***. AHRQ required three instances of communication with the EPC office from the partner entities while they worked on a selected evidence-based topic: one typically conveyed through e-mail to identify in writing which individuals from the organization would work on the selected topic[111] and two instances of verbal communication conveyed while participating in conference calls held by the EPC to refine the research questions

[110] Only two of the six respondents commented on assisting the partner entities in translating the evidence reports into with products. Reportedly, during the last two years of Program I, a few partner entities contracted with individual EPC staff members to assist them in translating the evidence reports for topics that their organization nominated into derivative products (Background Information, 2005). In Program II and III, AHRQ's EPC Program did not and does not allow individual EPC staff members or the EPC organization to receive monies from the partner entity for assisting it in translating the evidence report into a product (Background Information, 2005; EPC Partner Roles and Responsibilities, 2005 [current as of 2010]).

[111] The partners' electronic correspondence with the EPC office confirmed the names and contact information for two individuals from its organization who attended the conference calls on the selected topic that its organization nominated. (AHRQ, EPC Program I staff, Background Information: Partner Correspondence, August 10, 2006.)

and to identify relevant literature and the research design for the partner's selected topic.[112] Three instances of communication arguably are relatively few required contacts, which suggests that the Program exerted catalytic control over the partner entities.

Participating in the teleconferences provided the partners with incentives to help shape the evidence report for the topics that they nominated.[113] In fact, all six of the respondents reported that the partners regularly attended the teleconferences. Information that I attained from EPC J's archived quarterly reports also indicates that at least two members from the EPC entities attended the two teleconferences for the evidence-based topics (1997, 1998, 1999, 2000, 2001, 2002). Combined with the relatively few numbers of required partner contacts, the findings on this measure again suggest that Program I used catalytic control over the partner entities.

***2. EPC required correspondence.*** AHRQ required the EPC organizations to correspond with the Program office a mean of 26 times for each contract, approximately once a month (see Table 42). Although six of the seven EPC interviewees reported that the Program office rarely provided input into the research and writing or administrative pieces of communication that the EPCs sent to the office, each communication was directly tied to the EPCs' contract deliverable schedule of pay. If, for example, the EPC did not submit a quarterly report, it did not get paid. Also, the remaining pieces of correspondence (excluding a possible journal publication)

(Table 42 about here.)

[112] EPC J, staff member, background information: July 20, 2005; AHRQ, 2005, *EPC Program Partner Role and Responsibilities*, work document; EPC Program staff member, background information obtained during a telephone conversation on August 10, 2006 with a respondent whose position allowed them to offer an informed statement about the nature of control used by EPC Program I in overseeing required correspondence.

[113] The partner entity could help further shape the topic that it nominated by communicating with the program office during conference calls with the EPCs for which an evidence report would be drafted.

focused on the next steps needed to fulfill the contract deliverables.[114] This indicates that the EPCs had a financial incentive to communicate with the AHRQ EPC office each time they were required to, suggesting that the EPCs perceived not getting paid as a credible threat. Thus, the Program office used required EPC correspondence as a coercive mechanism. Each respondent noted that the EPCs communicated with the EPC office as required.

I found documentation confirming that the AHRQ EPC office made suggestions of additional advisory members for two of the eight evidence-based topics that EPC J worked on during Program I (1998, 2000). In each case, EPC J submitted the names of additional individuals to serve on the advisory and peer-review panels to the EPC office. The correspondence reported that the confirmed individual was willing to serve as member of the panel and included a signed and dated conflict of interest form on which the prospective panel member stated that s/he did not have a financial or other conflict of interest in serving as member of the expert panel for the selected topic (EPC J archives, 1998; EPC J archives, 2000). EPC J submitted this information prior to submitting any other work needed to fulfill the contract. Yet correspondence for one panel member for only two evidence-based topics is a relatively small number of required responses. This indicates that the EPC office used EPC correspondence on

[114] Program I stated that if an EPC office obtained approval, the EPC could publish findings from evidence reports in medical journals. But the EPCs' reimbursements for services rendered were not tied to such publications (AHRQ, background information: EPC publications, EPC Program staff member, May 11, 2005, and August 10, 2006; EPC J Contract, March 24, 1997; EPC J, staff person, background information: publications, July 20, 2005).

additional experts to serve as panel members for selected evidence-based topics at best as a catalytic control.

The nature of control used by EPC Program I over the network entities varied across the three measures. The type of control the EPC office used, if any, also varied by program actor (partner and EPC). Although the EPC office exerted catalytic control over the partners on the measure of required communication, the office did not appear to use any form of control over the partner either on drafting work schedules or on monitoring deadlines. I attribute this finding to the partners serving as volunteers in the EPC Program I network.

While the EPC office used required correspondence as a coercive control over the EPC entities, monitoring the EPC contract deadlines resulted in failed coercion over the 12 EPCs. Such failed coercion might be explained by a less hierarchical relationship that could have developed between EPC Program I and the EPC entities due to working together for an extended time. Finally, on drafting work schedules the EPC office exerted catalytic control over the EPC organizations.

Overall, these findings suggest that EPC Program I used catalytic controls over the partners on required correspondence and over the EPCs on drafted schedules of work.

**Catalytic control and effectiveness**. Next, I examined the possible relationships between Program I's catalytic controls and program effectiveness.

1. ***Translation effectiveness.*** Four of the six possible relationships are consistent with my predictions (see Table 43). As the number of times Program I used catalytic controls increased, the total number of program and EPC entity translations also increased. Yet when attention turns to catalytic controls and the number of translations by partners, none of the three possible relationships supports my hypotheses.

(Table 43 about here.)

As discussed earlier, the majority of translated evidence reports by partners were generated by professional associations. When these associations translated Program I evidence reports, they typically translated them into clinical practice guidelines. If the EPC Program had selected more topics that represented patients in everyday medical practice, such topics very well could have led to more translated evidence reports by the partner entities.

On the time taken to translate the evidence reports, all six of the relationships between catalytic controls and program effectiveness supported the proposition: as the number of times Program I used catalytic control increased, partner, EPC, and Program I translation effectiveness increased.

***2***. ***Dissemination effectiveness*****.** Similarly, the relationships between the number of times Program I used catalytic controls and the numbers of links to the partners', EPCs', and Program I's total products support my prediction (see Table 43). Increased use of catalytic control is associated with more links to products.

***3. Access effectiveness***. In contrast, none of the 18 possible relationships between use of catalytic controls and access to partner, EPC, or Program I total products supports my prediction. As the number of times EPC Program I used catalytic controls increased, access effectiveness decreased (see Table 43). As noted above, other variables likely better predict access effectiveness, such as the partners and EPCs being less familiar with the importance of providing public access to the derivative products and with the steps needed to do so.

**Summary.** Program I appears to have used catalytic control as the primary mechanism to support partners and EPCs in increasing translation, dissemination and accessibility effectiveness. Sixteen (44%) of the 36 possible relationships are consistent with my proposition about the ties

between Program I's use of catalytic control and greater program effectiveness. Still, despite relationships between catalytic controls and greater effectiveness in translation and dissemination, no links appeared to accessibility effectiveness.

## Conclusions

Overall, the three propositions and three hypotheses received mixed support. Yet as an initial exploratory study, the analysis revealed important information for administrators, policymakers, and researchers about the possible future effectiveness of the EPC Programs and other similar programs.

No support was found for Proposition 1, which predicted that coercive control Congress exerted over the Agency would be associated with lower levels of program effectiveness. Instead, the findings suggest that Congress may forgo exerting coercive control over an agency when there is a high degree of uncertainty among health experts about the best methodology to generate evidence reports. Moreover, the relationship between Congress and AHRQ appears to have evolved from top-down interaction to less hierarchical information sharing about issues including the well-documented ambiguity in the HSR policy arena. Ultimately, the EPC Program submitted the full report to Congress the following fiscal year.

Hypothesis 1, in contrast, was supported. The results indicate that, as expected, a more decentralized network is associated with lower levels of accessibility effectiveness. Knowing the extent of network centralization in distributing information on the steps related to providing free access to products, one may better predict accessibility effectiveness. AHRQ's EPC office coordinated the activities needed for accessibility effectiveness only twice. These findings also suggest overall lower levels of translation and dissemination effectiveness.

Program I's effectiveness was found to vary across the complexity indicators included in testing Hypothesis 2. When more than one partner worked on a selected evidence-based topic, greater numbers of EPC-authored products and total products were generated. The number of partners that worked on a topic also was positively associated with the numbers of links to partners', EPCs', and Program I's total products.

Although knowing the number of partners may help one to predict translation and dissemination effectiveness, it may not be as useful in predicting accessibility effectiveness. Instead, the number of levels of government represented among the entities that worked on the topic, at least during Program I, helped predict accessibility effectiveness. As hypothesized, as the number of levels of government involved increased, the numbers of free online products accessible immediately upon publication for partner-authored products and for Program I as a whole decreased. Also as expected, the number of levels was negatively related both to the numbers of fully accessible online products six months after publication for partner-authored products and Program I total products and to the numbers of freely accessible online products one year after publication for partner-authored products.

In addition, when the entities that worked on a topic were from both the public and private sectors, more total products were translated and less time was taken to translate reports into products. Both relationships were in the opposite direction of my hypotheses. Yet as expected, more regions being represented among the organizations that worked on a topic increased the amount of time it took to translate reports into products for Program I overall.

While I found little support for Hypothesis 3, weak ties were associated with fewer partner-authored products during Program I as expected. Yet weaker ties were associated with more evidence report translations for EPCs and for Program I network overall. Additionally, the

findings point to greater dissemination effectiveness as tapped by the number of links to the products of partners, EPCs, and Program I overall.

A fair amount of support is found for Proposition 2. The results indicate a relationship between funding and translation effectiveness: lack of funding was associated with a low number of products generated by the partner entities. Yet negative relationships between funding and EPC and Program I total products was found, the opposite direction predicted. Between congressional appropriations and PHS allocations, AHRQ received annual funding increases in each year of Program I (1997 to 2002). HHS also authorized the EPC Program to select more evidence-based topics almost annually throughout Program I, which served to increase the Program's operating budget. However, EPC interviewees reported continually lacking funds to conduct their work effectively. Insufficient financial resources for conducting annual effectiveness analyses suggested lower overall program effectiveness. Also, the lack of funding for staff members at the 12 EPCs to attend and present papers at medical conferences on their evidence report translations evidently was associated with lower degrees of dissemination effectiveness. Not having funds allocated for EPC infrastructure expenditures on computer networking was related to lower levels of translation, dissemination, and accessibility effectiveness. Similarly, a lack of funds for the EPCs to meet partners to refine research topics and identify relevant literature to include in the evidence reports (throughout Program I, II, and III to date) is linked as well to lower translation, dissemination, and accessibility effectiveness. From these findings, I conclude that insufficient funding may have been linked to somewhat lower degrees of translation and dissemination effectiveness during Program I. Although none of the interview respondents implied that AHRQ's funds could have been associated with accessibility effectiveness, annual funding for providing free online access to the products most

likely could have increased the program's accessibility effectiveness (e.g., funds coordinate and support the partner entities providing free online accessibility to the products).

The EPC office exerting no control over the partner entities appeared prevalent during Program I across two of three measures: drafting schedules and monitoring contract deadlines. This might help explain the somewhat lower translation effectiveness as tapped by the relatively low numbers of partner-authored products. Catalytic control appears to be the primary control Program I used over both the partner and EPC entities to support translation, dissemination and accessibility.

Although the results suggest that the EPC office may not have used any control over partner entities and failed to exert coercive control over the EPCs, half of the relationships explored supported the proposition. Program I's use of catalytic control was positively associated with translation effectiveness, tapped both by greater numbers of evidence report translations (for EPCs and program I as a whole) and by the time taken for translation. Catalytic controls also were associated with dissemination effectiveness, measured by the number of links to the partners', EPCs', and the overall program's products. Yet catalytic control used by the EPC Program I was associated with fewer products authored by the partners, the opposite of what I predicted.

Moreover, none of the relationships between Program I's use of catalytic control and access to the partners', EPCs', or Program I's overall products was consistent with my predictions. Ultimately, the journal that published or posted Program I's products on its website controlled whether the product would be accessible to the public with a fee, which had a direct impact on access effectiveness.

The next final chapter discusses the study's conclusions, possible implications of the findings, and areas of future research.

# CHAPTER 7

## CONCLUSIONS

The dissertation assessed the effectiveness of Program I and why it was as effective as it was. Effectiveness varied across three dimensions. Overall, I found somewhat high levels of translation and dissemination effectiveness, yet relatively low levels of accessibility effectiveness. My predictions for why Program I was as effective as it was received mixed support. Yet as an initial exploratory study of a network, the analysis revealed important information for administrators, policymakers, and researchers about the possible future effectiveness of the EPC Programs and other similar programs that operate in a complex network of entities with which it contracts and those it partners with to do its work. For example, more than one partner working on a topic was associated with higher translation effectiveness as tapped by greater numbers of EPC authored-products and total products. Having more than one partner working on a topic also was associated with higher dissemination effectiveness, that is with more links to the partners', EPCs', and Program I's overall products. In addition, both public and private sectors working on a topic was associated with higher translation effectiveness, indicated by more total products and by less time taken to translate reports into products. Moreover, weak ties among network actors and lack of funding both were associated with fewer partner-authored products.

The analysis also suggested alternative explanations of Program I's translation, dissemination and accessibility effectiveness. The nature of the organizations involved in Program I had a direct impact on effectiveness. Most of the partners supported at least one peer-reviewed journal and internet database where the majority of the partner and EPC products published; this could help explain higher dissemination effectiveness as tapped by the number of

links to products. Similarly, since the journals controlled whether a product was fully available online without a monetary fee for public access, the nature of the partners that sponsored the journals had a direct impact on accessibility effectiveness.

The nature of the EPCs also had a direct impact on translation effectiveness. The EPCs primarily were teaching hospitals and are well regarded for their staffers' journal articles on the findings from medical studies. Because the EPCs authored the majority of products generated during Program I, the nature of the EPCs directly influenced overall translation effectiveness.

In addition, the partners and EPCs affected the time taken to translation for Program I overall. From my analyses, I conclude that relatively little time taken to translate the evidence reports may be attributed to the partners and EPCs generating products without working together. Although initially these results might appear to suggest increased translation effectiveness as tapped by the time taken to translation, closer analysis suggests otherwise. The majority of the products generated did not directly apply to everyday health care delivery practice and did not coincide with the Program I's intent, signaling lower levels of effectiveness across all three dimensions. Had many of the non-HHS partners and EPCs shared their expertise with one another in translating evidence reports, more products that applied to physicians' patient populations may have been generated during Program I. Such products (e.g., guidelines) typically generated greater numbers of links. Additionally, these products were publicly accessible online for free immediately upon publication. Moreover, such collaboration between the actors and product output would have coincided with the intent of Program I and might even have led to enhancing the quality of U.S. health care delivery more quickly.

Considering the specific roles of the entities that worked in the Program also provides insights into impacts on effectiveness. The partners were responsible for translating evidence

reports into products. As noted, the partners generated significantly fewer translations than the EPCs. Since the partners usually authored products that could be applied to everyday health care delivery (the intended output supported by Program I), fewer partner-authored products signaled overall lower levels of translation and dissemination effectiveness for Program I. Additionally, due to the nature of the products generated by the partners (typically guidelines and reimbursement policies) that were publicly accessible online at no charge, the fewer partner-authored products also resulted in lower levels of accessibility effectiveness.

Yet the partners' ability to fulfill their role was affected in part by the EPCs. AHRQ contracted with the EPCs not only to draft the evidence reports but also to assist the partners in translating the reports into products. Due to the expertise ostensibly required to identify the links between the evidence reports (typically based on findings from test-subject populations) to physicians treating the everyday patients, the partners needed the EPCs' assistance. However, the EPCs collectively decided not to assist the partners as contracted and so informed the Program office. Since the EPCs were contractually bound to assist the partners in translating evidence reports, the Agency could have withheld payment to the EPCs for not completing the contracts.

### Possible Prescriptions

The results also point to possible prescriptions. Program I was designed to support the development of such products as they are linked to improving the quality of U.S. health care delivery. Since the partners arguably needed the EPCs' technical assistance to increase the quantity of these translations generated, AHRQ might consider putting the translation assistance requirement back into the EPC contracts and withhold payment to an EPC for neglecting to fulfill the contract.

Furthermore, despite having the responsibility for translating evidence reports, the partners accomplished noticeably less of this than the EPCs. During EPC Program I (and well into 2011), the Agency informed the partners in writing that if they did not translate evidence reports and disseminate the products to their members and affiliates, the Program might not select another topic from their organizations for funding. EPCs, however, were paid when the completing their contracts (i.e., when they completed drafting evidence reports). If an EPC did not complete a project, AHRQ could withhold payment. In the future, the Agency might well either revise the type of agreement that it makes or enter into an agreement only with organizations that fulfilled prior agreements.

Despite AHRQ's mandate to facilitate publicly accessible research and evidence based products from the programs it supports, more than half of the derivative products developed by AHRQ's Program I required a monetary fee for public access. In the future the Program might implement an information management system that includes the steps needed to support free public access to derivative products. Such a system could include a database of journals that provide free public access to publications, and the task order officer assigned to the topic might work with the partner and EPC authors to submit their evidence report translations to these journals.[115] By ensuring free public access to the products generated by the programs it supports, AHRQ can more effectively fulfill one of its mandates – to provide widely available evidence-based practices to the general public.

**Implications**

With increased use of the internet, free online public access to the research and products generated by the Agency's EPC Programs have become more important. Due to patients

[115] To date, no administrative system exists for organizing public access to the products generated from the EPC Programs. (Background Information, 2006; Document Review, February 2011.)

becoming more actively engaged in health care and advances in computer technology, the general public obtains more direct access to medical information (Pew, 2008). Pharmaceutical companies and other organizations increasingly provide a wide range of information on treatments available on the internet for free to the public (Fink, 2005). However, the treatment options for diseases and conditions reported on the internet can lack verification; the type of assessment conducted by government programs including AHRQ's EPC Programs verify the quality of the results reported in published health care studies (Ibid.).

Free public access to products supported by government programs such as the EPC Programs can serve as a useful starting point for patients and medical professionals. Patients and physicians need reliable information on which to base their health care decisions. Public access to vetted health care information funded by government entities such as the reports and products generated by AHRQ's EPC Program I and similar initiatives could more immediately and directly impact the quality of everyday health care delivery.

Normatively, a financial and moral obligation exists for government to promote the public interest by providing public access to the products generated through AHRQ's EPC Programs. Financially, governments—the public—are the largest consumers of health care delivery services. The widespread variation in health care delivery practices that still exists today, including overtreatment, undertreatment and medical errors, can increase government expenditures. It also can impact a patient's productivity and ability to secure and retain employment.

A moral obligation arguably also exists for the U.S. government to provide free public access to vetted reports and the products that it funds. Health is the primary mechanism for overall individual well-being. Free online public accessibility to the products generated by the

EPC Programs can assist the general public (including scientists, physicians, teachers and others from a wide range of occupations) to make more informed decisions about everyday health care delivery. Health care scientists and physicians who lack subscriptions to the product publications when attempting to develop evidence-based practices could better advance knowledge with unrestricted access to the evidence reports and free public access to the derivative products.

Congress mandated that AHRQ provide wide public access to the research and evidence-based practice products that it develops or supports. By facilitating both unrestricted access to evidence reports and free public access to the products generated by its EPC Programs, the Agency can more effectively fulfill this mandate. In complying with this mandate, the Agency may more immediately and directly increase the quality of U.S. health care delivery.

## Future Research

As the first comprehensive effectiveness analysis of AHRQ's EPC Program I network. By operationalizing the Agency's mandate this dissertation established translation, dissemination and accessibility measures for assessing the effectiveness of the EPC network programs and other similar government-sponsored program networks. One of the aims of this study was to serve as a basis for future effectiveness analyses of EPC Programs II (2002 to 2007) and III (2007 to 2012). Although the results here contribute to better understanding of the dynamics that can be associated with the effectiveness of similar programs, additional research is needed to attain greater insight into the circumstances under which translation, dissemination, and public accessibility might be delayed or accelerated, thus bolstering explanations for the effectiveness of government programs. One immediate research project is to examine the possible relationships between network complexity and the translation, dissemination and accessibility

effectiveness of EPC Program II.[116] By operating in a network of multidisciplinary teams of public-private partners located at multiple levels and across various regions during the first few years of the program, EPC Program I complied with the organizational requirements of the Agency's statute. Yet during the last two years of Program I, the network evidently became less complex, with fewer partners, actors located in fewer regions and sectors working on each topic. I found evidence that this trend may have continued into Programs II and III. However, the results of this study suggest that greater network complexity (tapped by the number of partners) was associated with higher translation effectiveness (more EPC-authored and total Program I products) and higher dissemination effectiveness (more links to products). Additionally, when individuals from both the public and the non-profit sectors worked on a topic, translation effectiveness increased, with both more products and less time taken to translate reports into products. Further research that assesses the relationships between the extent of network complexity and translation, dissemination and accessibility effectiveness during Program II and III might help further clarify such links.

A second, related project might further examine the possible relationships between network centralization and accessibility effectiveness during Program II. The results of this study suggest that greater network centralization, tapped by AHRQ as the NAO distributing information on steps related to providing free access to products, could lead to overall higher accessibility effectiveness.

Additionally, analyses of the evidence here suggest that considerable conflict among the network actors frequently occurred and often resulted in delays in drafting many evidence reports and in foregoing translation of others. The conflicts were associated with differences in goals, in familiarity with EBM methodology, and in varying philosophical orientations among

[116] Not enough time has passed to conduct an effectiveness analysis of EPC Program III.

the actors that worked on topic. Many of the respondents reported that if the EPC office had intervened to resolve the disputes, these conflicts could have been reduced, which would have led to greater program effectiveness. Although the interviewees did not offer examples to support a tie between such conflict mediation and effectiveness, they maintained that the Agency should have been so involved. Further research is needed into the involvement of similar government programs in resolving conflicts among network actors and its possible associations with program effectiveness. Moreover, further research might explore the activities of related government programs in facilitating collaboration among multidisciplinary teams of network actors and the possible impact on program effectiveness.

Information gathered from such future research could assist policymakers, public administrators and researchers make decisions about similar programs. Such information also might help one to predict the Agency's outcome effectiveness in increasing the quality of U.S. health care delivery practices. Additionally, Provan et al. (2007) assert that still little is known about how effective government is when contracting out and operating in broad complex multidisciplinary networks of public and private entities. Such future research that examines the effectiveness of EPC Program II and III will contribute to such understanding.

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## Appendices

## Appendix A:

## Glossary of Terms

"*Consumers, educators, healthcare practitioners and providers, patients, and policymakers,"*[117] I interpret to mean the general public.

*Dissemination* is the process by which knowledge and information are conveyed to external audiences (AHRQ, 2000, 2005, 2010). Dissemination of tools, programs, or policies occurs when these products are "widely available"[118] to consumers, educators, health care practitioners and providers, patients and policymakers.[119]

*Evidence-based practice*: "An approach to clinical decision making and health care policy that promotes the integration of the most valid and relevant evidence from scientific research with clinical observation and patient reports to decide which treatments, tests, and technologies are most effective and appropriate for program design, coverage, and patient care" (AHRQ, 2000, 2005, 2010).

*Health services research* (HSR) focuses on the process by which everyday health care is delivered, the extent of access to medical treatment, the cost, and the outcomes of clinical care. HSR also tracks variation in health care delivery and ways to reduce medical errors and improve patient safety (Field,Tranquada & Feasley, 2003).

*Geographically diverse locations*, I define as being different regions of the U.S. that are not similar in terms of geographic typography. An example of geographically diverse centers might include the Blue Cross and Blue Shield Policy Center (i.e., Midwest), Duke University (i.e., South), the New England Medical Center (i.e., East), and RAND (i.e., West) are located in geographically diverse regions of the U.S.

*Multidisciplinary*: I define multidisciplinary as a group of employees that do not have the same training or credentials (i.e., academic degrees) but they are working on the same project (e.g., translation of an evidence report). An example of a multidisciplinary group of employees that are working on the same project might be a, physician, policy analyst, webmaster, and an economist.

*Network*: I interpret the term "network" to be a group of employees that are working on the same project but at different physical addresses (i.e., locations). Further, the locations where the employees are working can be legally separate interacting units of various organizations. For example, a network might be a group (e.g., more than three) of employees that are dispersed among multiple units of organizations including American College of Cardiology, U.C. San Francisco and Stanford Medical Centers and AHRQ. This group of employees might be working

[117] See the *Healthcare Research and Quality Act of 1999.*
[118] Ibid.
[119] See the *Healthcare Research and Quality Act of 1999.*

on the same project, but they are working at different organizations and in some cases, they are working at different regions of the U.S.

*Provider-based:* I define the term “provider-based” as organizations that provide health services delivery to patients. For example, teaching hospitals provide health service delivery to patients. In doing so, teaching hospitals have the ability to directly link research to clinical practice.

*Translation* is "putting research findings and other information into language that allows it to be understood and used by different audiences” and applied to clinical setting.

*Widely available*: The term widely available is not operationalized in the Agency’s authorizing legislation, its GPRA Strategic Performance Plans, or in the GPRA Performance Results. I am interpreting widely available to mean that a product that has been based upon an EPC Program evidence report is accessible on major health care databases and in a medical journal if a potential user is looking for the information. Widely available might also mean that the information can be found in a medical conference. However, due to the limitations of this study, measuring the extent to which prospective evidence report derivate products are available at a medical conference will not be assessed.

## Appendix B:

## Comprehensive Evaluation

| EVALUATION | ANTECEDENT PHASE | TRANSACTIONAL PHASE | OUTCOME PHASE |
|---|---|---|---|
| DESCRIPTION<br>▪ INTENT<br>▪ OBSERVATIONS | | | |
| JUDGMENTS<br>▪ CRITERIA<br>▪ JUDGMENTS | | | |

Source: Adapted from Evert Vedung, 2000,
*Public Policy and Program Evaluation*, pp. 63-4.

## Appendix C:

## Criteria for Assessing the Six Approaches to an Effectiveness Evaluation

| | CRITERION | | | |
|---|---|---|---|---|
| APPROACH | CENTRAL FOCUS | FEASIBILITY | EASE IN COMMUNICATING | TOTAL |
| Side-Effects | | X | X | 2 |
| Goal-Free | | X | X | 2 |
| Client-Oriented | | X | X | 2 |
| Stakeholder | | | X | 1 |
| Comprehensive | | X | | 1 |
| GAM | X | X | X | 3 |
| TOTAL | 1 | 5 | 5 | 11 |

The symbol "X" represents whether the criterion is met.

## Appendix D:

## Protocol: Data Collection on the Dependent Variables

(About here.)

## Appendix E:

## Anonymity and Confidentiality Agreement

(About here.)

## Appendix F:

## Virginia Tech Institutional Review Board Approval Forms

(2005-6 About here.)

**Appendix F (continued):**

**Virginia Tech Institutional Review Board Approval Forms**

(2006-7 About here.)

**Appendix F (continued):**

**Virginia Tech Institutional Review Board Approval Forms**

(2007-8 about here.)

**Appendix F (continued):**

**Virginia Tech Institutional Review Board Approval Forms**

(2008-9 about here.)

**Appendix F (continued):**

**Virginia Tech Institutional Review Board Approval Forms**

(2009-10 about here.)

**Appendix F (continued):**

**Virginia Tech Institutional Review Board Approval Forms**

(2010-11 about here.)

## Appendix G:

## Telephone Questionnaire

(About here.)

## Appendix H:

### Summary Statistics: Time taken to Translate Evidence Reports by Translator

| | TIME TAKEN TO TRANSLATION | | |
|---|---|---|---|
| | Partners | EPCs | Total |
| Mean | 11.9 | 12.44 | 12.5 |
| Median | 12.5 | 10.5 | 11 |
| Mode | N/A | 10 | 11 |
| Std. Deviation | 15.695 | 8.937 | 8.198 |

## Appendix I:

### Journal Subscriptions Summary Statistics

| | TOTAL NUMBERS OF SUBSCRIPTIONS |
|---|---|
| Mean | 318,000 |
| Median | 105,000 |
| Mode | N/A |
| Std. Deviation | 805,000 |
| TOTAL | 1,654,027 |

## Appendix J:

## Summary Statistics: Time[120] Taken to Translate Evidence Reports by Numbers of Partners

| PARTNERS | TIME (MONTHS) | |
|---|---|---|
| ***n*** | ***n*** | TOTAL |
| One Partner Less Complexity | Median | 11 |
| | *Mean* | *12.99* |
| | Mode | 11 |
| | St. Deviation | 12.791 |
| More than One Partner (2 to 4, 6 & 11) More Complexity | Median | 12.5 |
| | *Mean* | *11.35* |
| | Mode | NA |
| | Std. Deviation | 9.522 |
| TOTAL | Median | 11 |
| | *Mean* | *12.47* |
| | Mode | 11 |
| | Std. Deviation | 11.798 |

[120] Time is measured in months, beginning from the date the report was completed to the date the product was published.

## Appendix K:

### Summary Statistics: Disseminated Products by Numbers of Partners

| PARTNERS | | LINKS TO PRODUCTS | | |
|---|---|---|---|---|
| ***n*** | | **PARTNERS** | **EPCS** | **TOTAL** |
| One Partner | Numbers | 978 | 2499 | 3477 |
| Less Complexity | *Median* | *8* | *27* | *27* |
| | Mean | 31.55 | 59.5 | 66.87 |
| | Mode | 2 | 11 | 2 |
| | Std. Deviation | 45.135 | 88.802 | 95.001 |
| More than One Partner | Numbers | 1165 | 1972 | 3137 |
| (2 to 4, 6 & 11) | *Median* | *19* | *104* | *114* |
| More Complexity | Mean | 83.21 | 109.56 | 149.38 |
| | Mode | 4 | NA | 4 |
| | Std. Deviation | 130.628 | 74.392 | 150.971 |
| TOTAL | Numbers | 2143 | 4471 | 6614 |
| | *Median* | *10* | *33* | *40* |
| | Mean | 47.62 | 74.52 | 90.6 |
| | Mode | 4 | NA | 4 |
| | Std. Deviation | 83.759 | 87.233 | 118.9 |

## Appendix L:

## Summary Statistics: Time Taken to Translate Evidence Reports by Numbers of Regions

| REGIONS | TIME (MONTHS) | | | |
|---|---|---|---|---|
| ***n*** | ***n*** | PARTNERS | EPCS | TOTAL |
| One Less Complexity | Median | -4.5 | 9.5 | 4.5 |
| | *Mean* | -6.25 | 5.67 | 2.67 |
| | Mode | NA | 11 | 11 |
| | Std. Deviation | 10.21 | 7.474 | 9.48 |
| More than One (2 to 5) More Complexity | Median | 13 | 10 | 14 |
| | Mean | 15.06 | 11.57 | 13.5 |
| | Mode | NA | 10 | 11 |
| | Std. Deviation | 18.246 | 10.452 | 11.607 |
| TOTAL | Median | 11.5 | 10 | 11 |
| | *Mean* | 12.69 | 10.91 | 12.47 |
| | Mode | NA | 10 | 11 |
| | Std. Deviation | 18.706 | 10.276 | 11.798 |

## Appendix M:

## Access to Partner Products by Numbers of Regions

| *Regions* | TOTAL PRODUCTS | PARTNER PRODUCTS: *Access after Publication* IMMEDIATE | | 6 MONTHS | | 12 MONTHS | |
|---|---|---|---|---|---|---|---|
| ***n*** | ***n*** | ***n*** | **%** | ***n*** | **%** | ***n*** | **%** |
| One Less Complexity | 6 | 4 | 67 | 4 | 67 | 4 | 67 |
| More than One (2 to 5) More Complexity | 59 | 49 | 83 | 51 | 86 | 51 | 86 |
| **TOTAL** | **65** | **53** | **82** | **55** | **85** | **55** | **85** |

## Appendix N:

## Program I Total Translations (Products) by Numbers of Sectors

| SECTORS | PRODUCTS | |
|---|---|---|
| *n* | *n* | TOTAL |
| | Topics | 11 |
| One | Products | 14 |
| (Public) | Topics to Products Ratio | 1.273 |
| Less Complexity | Median | 1 |
| | Mean | 1.27 |
| | Mode | NA |
| | Std. Deviation | 1.737 |
| More than One | Topics | 82 |
| (Public and Private) | Products | 177 |
| More Complexity | Topics to Products Ratio | 2.159 |
| | Median | 2 |
| | Mean | 2.16 |
| | Mode | 1 |
| | Std. Deviation | 2.003 |
| TOTAL | Topics | 93 |
| | Products | 191 |
| | Topics to Products Ratio | 2.054 |
| | Median | 1 |
| | Mean | 2.05 |
| | Mode | 1 |
| | Std. Deviation | 1.986 |

## Appendix O:

### Time to Translation by Numbers of Sectors

| SECTORS | | TIME (MONTHS) |
|---|---|---|
| *n* | *n* | TOTAL |
| One | Median | 22 |
| Less Complexity | *Mean* | *19.75* |
| | Mode | NA |
| | Std. Deviation | 6.702 |
| More than One | Median | 11 |
| More Complexity | *Mean* | *11.97* |
| | Mode | 11 |
| | Std. Deviation | 11.94 |
| TOTAL | Median | 11 |
| | Mean | 12.47 |
| | Mode | 11 |
| | Std. Deviation | 11.798 |

## Appendix P:

## Immediate Access to Partner Products and Total Products by Level

| *Levels* | | | *Accessibility* Immediate |
|---|---|---|---|
| *n* | *n* | *n* | % |
| | PARTNER TOTAL PRODUCTS | | |
| One Less Complexity | 42 | 38 | 90 |
| More than One 2 to 5 More Complexity | 23 | 15 | 65 |
| TOTAL | 65 | 53 | 82 |
| | PROGRAM I TOTAL PRODUCTS | | |
| One Less Complexity | 116 | 48 | 41 |
| More than One More Complexity | 75 | 18 | 24 |
| TOTAL | 191 | 66 | 35 |

## Appendix Q:

## Access to Partner and Program I Total Products Six Months after Publication by Level

| *Levels* | | *Accessibility* 6 MONTHS AFTER | |
|---|---|---|---|
| *n* | *n* | *n* | % |
| | PARTNER TOTAL PRODUCTS | | |
| One Less Complexity | 42 | 38 | 90 |
| More than One 2 to 5 More Complexity | 23 | 17 | 74 |
| TOTAL | 65 | 55 | 85 |
| | PROGRAM I TOTAL PRODUCTS | | |
| One Less Complexity | 116 | 56 | 48 |
| More than One 2 to 5 More Complexity | 75 | 29 | 39 |
| TOTAL | 191 | 85 | 45 |

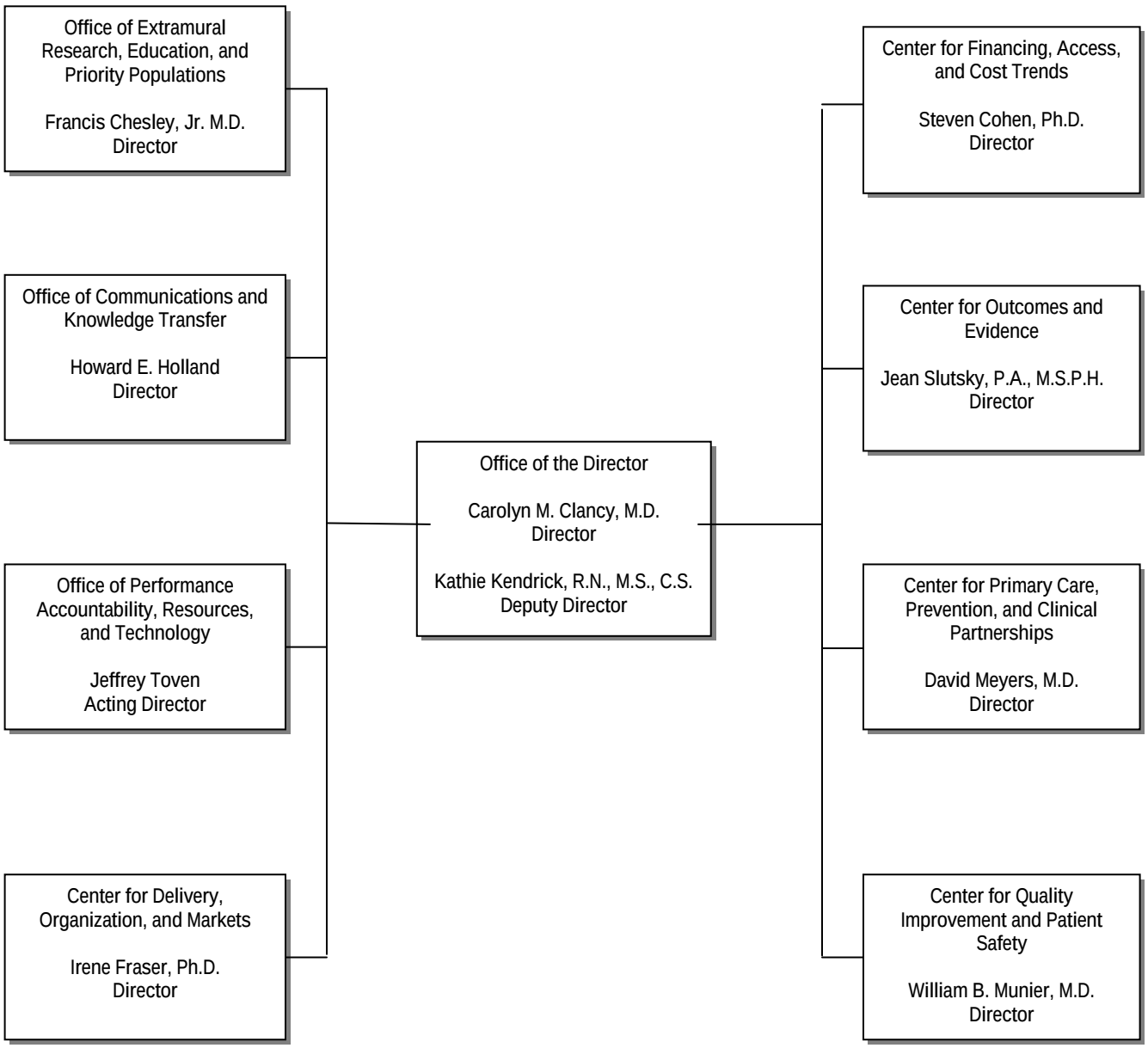
## Appendix R:

## Access to Partner and Program I Total Products 12 Months after Publication by Levels

| *Levels* | PARTNER TOTAL PRODUCTS | | *Accessibility* 12 MONTHS AFTER |
|---|---|---|---|
| *n* | *n* | *n* | % |
| One Less Complexity | 42 | 38 | 90 |
| More than One 2 to 5 More Complexity | 23 | 17 | 74 |
| TOTAL | 65 | 55 | 85 |
| *Levels* | PROGRAM I TOTAL PRODUCTS | | *Accessibility* 12 MONTHS AFTER |
| *n* | *n* | *n* | % |
| One Less Complexity | 116 | 57 | 49 |
| More than One 2 to 5 More Complexity | 75 | 31 | 41 |
| TOTAL | 191 | 88 | 46 |

**Figure 1:**

**Agency for Healthcare Research and Quality: Organization Chart**




Source: AHRQ Publication No. 10-M048,
Replaces AHRQ Publication No. 08-M029,
[Current as of July 2010].

**Figure 2:**

**Example of Evidence-based Topic Nominators**

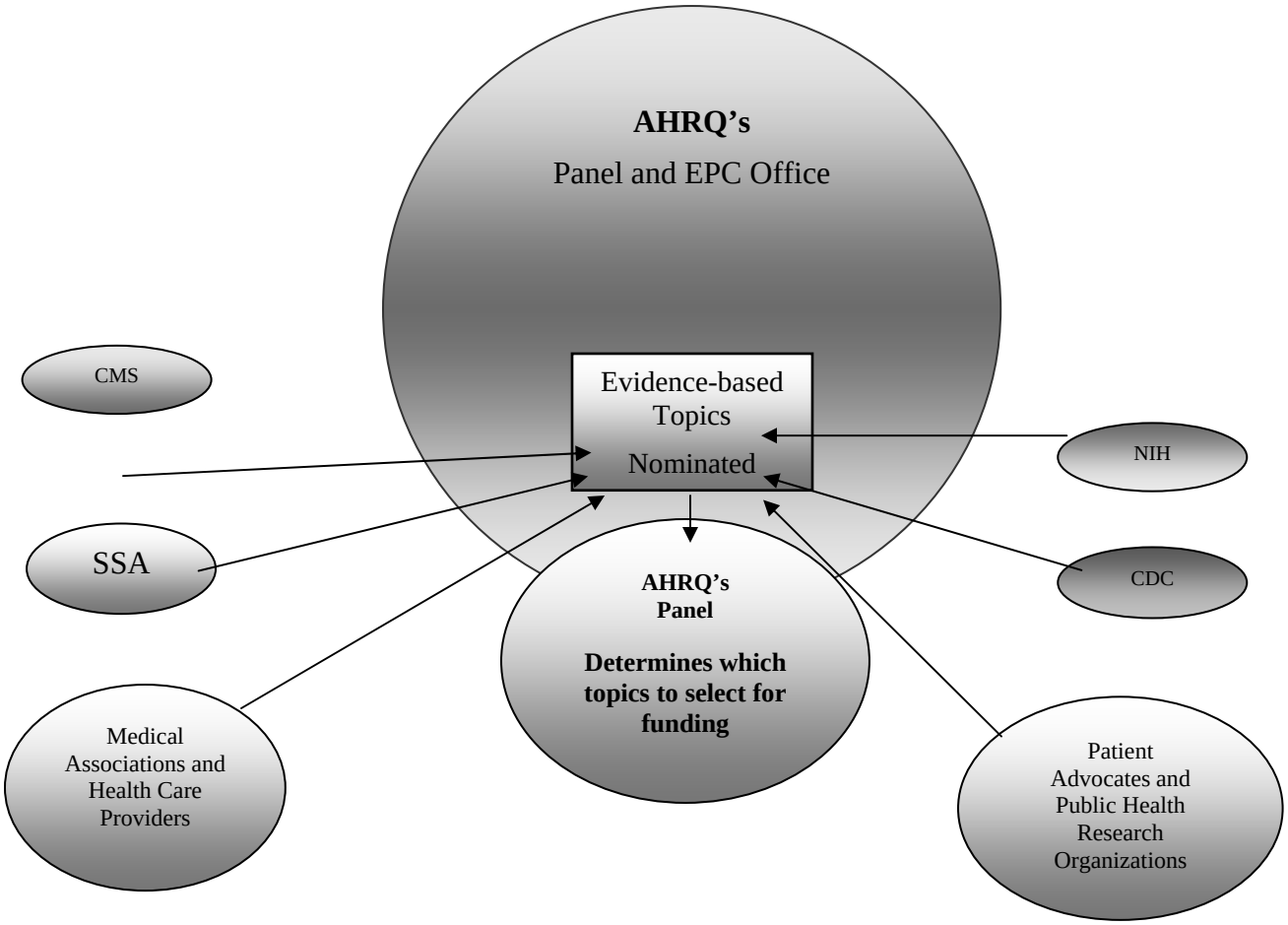


**Figure 3:**

**EPC Contracting**

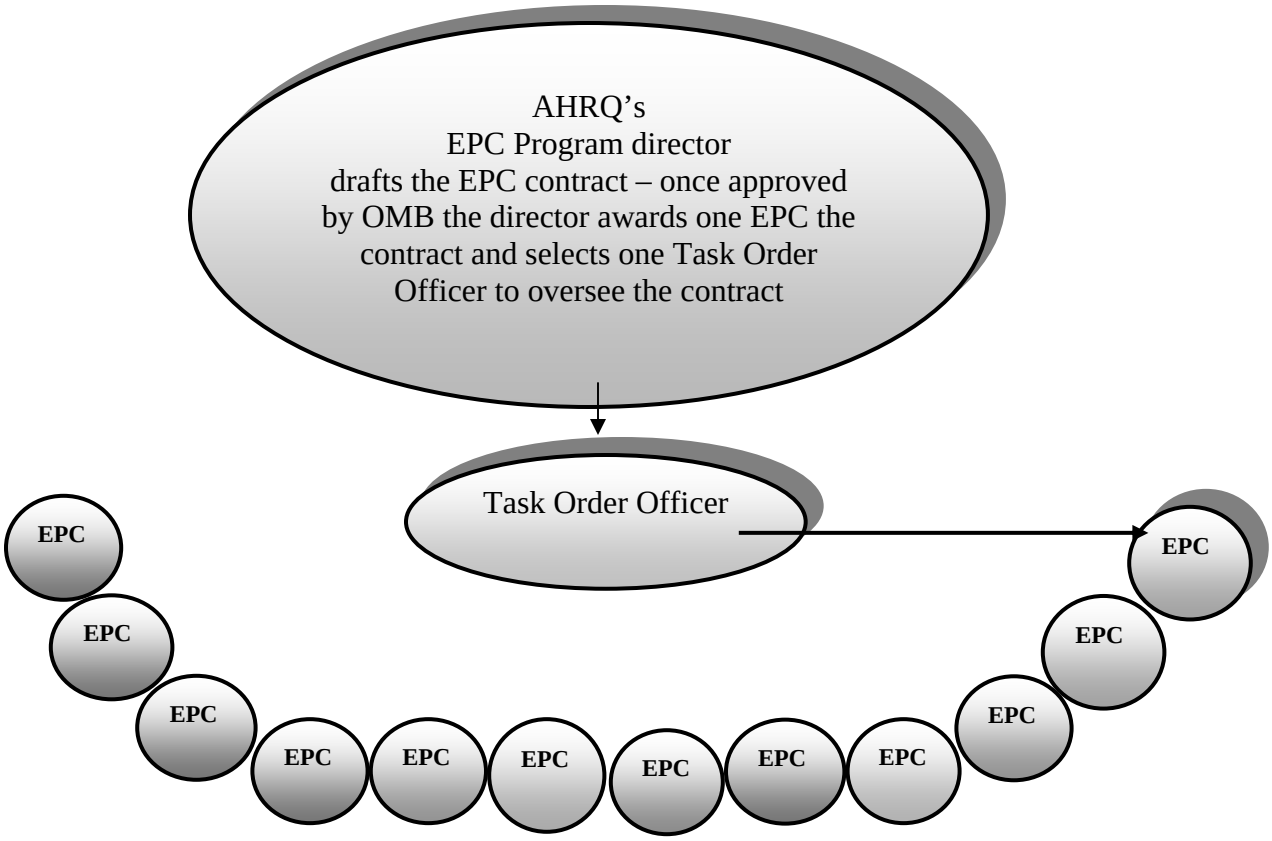
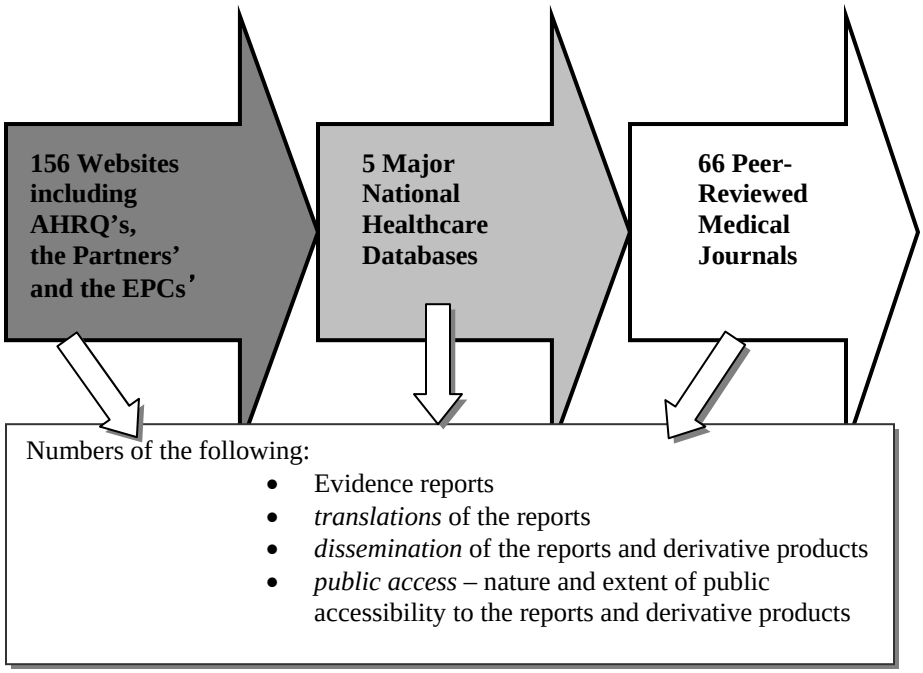


**Figure 4:**

**Dependent Variables: Data Sources and Indicators**



## Figure 5:

## Five Independent Variables: Indicators and Data Sources

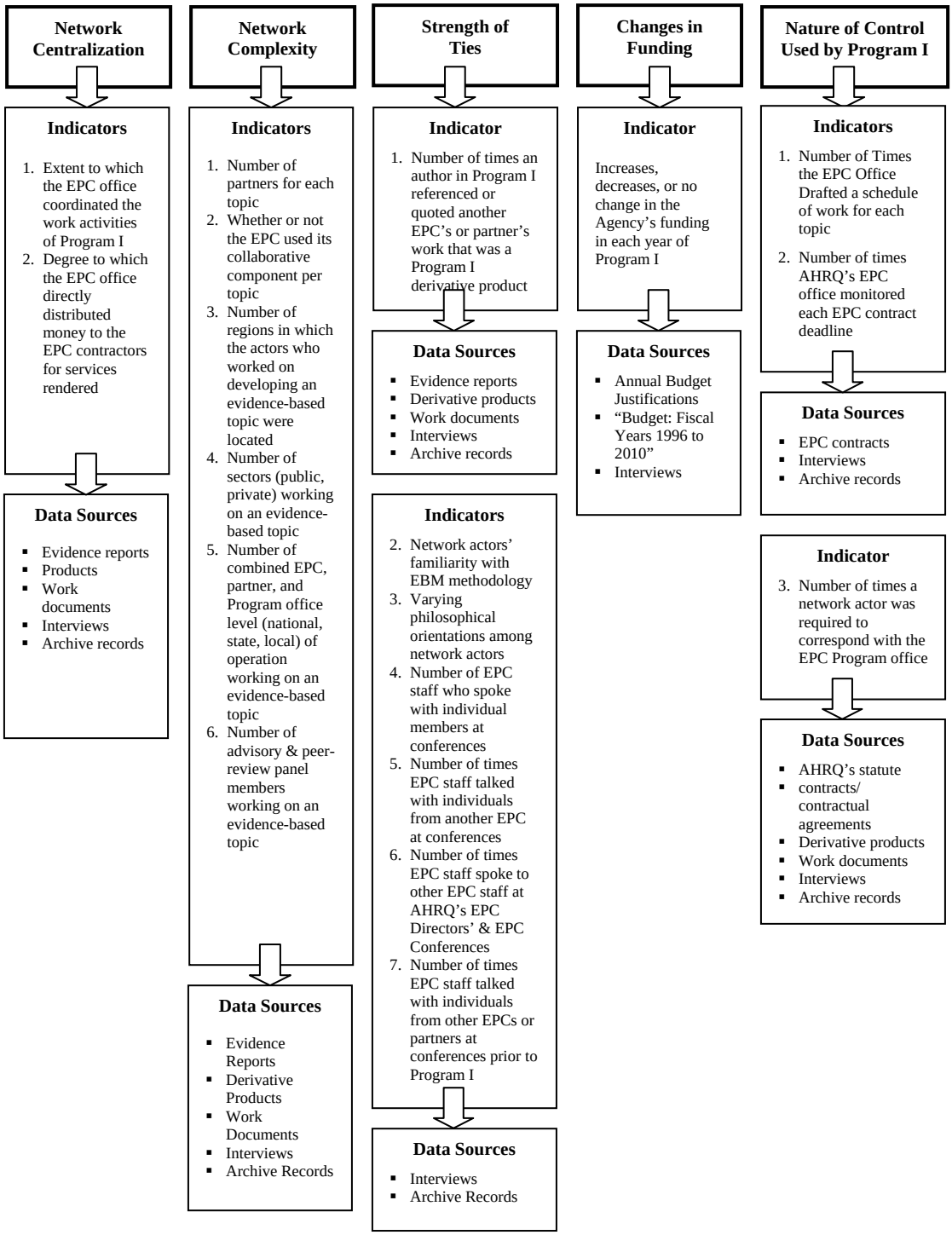
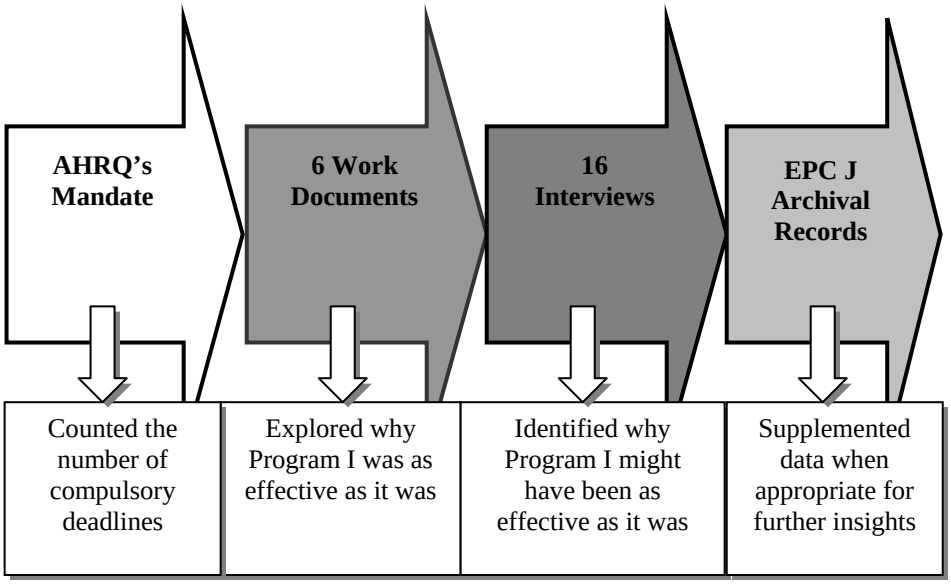


**Figure 6:**

**Independent Variables: Data Sources and Tasks**



## Tables

### Table 1:

### AHRQ'S FUNDS AND FUNDING SOURCES: FYS 1994 TO 2011

| FYS | SOURCES | FUNDS |
|---|---|---|
| **1994** | Congressional appropriations | 135,409,000. |
| | Medicare trust fund | 5,786,000. |
| | PHS evaluation fund | 13,204,000. |
| | **TOTAL** | **$154,399,000.** |
| **1995** | Congressional appropriations | 135,290,000. |
| | Medicare trust fund | 5,796,000. |
| | PHS evaluation fund | 18,300,000. |
| | **TOTAL** | **$159,386,000.** |
| **1996** | Congressional appropriations | 65,045,000. |
| | Medicare trust fund | 0. |
| | PHS Evaluation fund | 60,124,000. |
| | **TOTAL** | **$125,169,000.** |
| **1997** | Congressional appropriations | 96,567,000. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 47,412,000. |
| | **TOTAL** | **$143,979,000.** |
| **1998** | Congressional appropriations | 90,304,000. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 56,206,000. |
| | **TOTAL** | **$146,510,000.** |
| **1999** | Congressional appropriations | 100,308,000. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 70,647,000. |
| | **TOTAL** | **$170,955,000.** |
| **2000** | Congressional appropriations | 115,223,000. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | $88,576,000. |
| | **TOTAL** | **$203,799,000.** |
| **2001** | Congressional appropriations | 104,963,000. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 164,980,000. |
| | **TOTAL** | **$269,943,000.** |
| **Rescission** | Congressional appropriations | 104,816,000. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 164,980,000. |
| | **TOTAL** | **$269,796,000.** |

| | | |
|---|---|---|
| **2002** | Congressional appropriations | 2,600,000. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 296,145,000. |
| | **TOTAL** | **$298,745,000.** |
| **2003** | Congressional appropriations | 0. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 303,695,000. |
| | Bioterrorism | 5,000,000. |
| | **TOTAL** | **$308,695,000.** |
| **2004** | Congressional appropriations | 0. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 318,695,000. |
| | **TOTAL** | **$318,695,000.** |
| **2005** | Congressional appropriations | 0. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 318,695,000. |
| | **TOTAL** | **$318,695,000.** |
| **2006** | Congressional appropriations | 0. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 318,692,000. |
| | **TOTAL** | **$318,692,000.** |
| **2007** | Congressional appropriations | 0. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 318,692,000. |
| | **TOTAL** | **$318,692,000.** |
| **2008** | Congressional appropriations | 0. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 334,564,000. |
| | **TOTAL** | **$334,564,000.** |
| **2009** | Congressional appropriations | 0. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 372,053,000. |
| | ARRA funding P.L. 111-5 | 1,100,000,000. |
| | **TOTAL** | **$1,472,053,000.**[121] |

[121] "In FY 2009, the *American Recovery and Reinvestment Act* (ARRA) allocated $1,100,000,000 billion for Comparative Effectiveness Research" (ARRA, 2009). Of the $1.1 billion, $400,000,000 was transferred to the National Institutes of Health. (Ibid.) At the discretion of the Secretary of the U.S. Department of Health and Human Services (HHS) a total of $400,000,000 is available for allocation to Comparative Effectiveness Research. In addition, a newly established Federal Coordinating Council for Comparative Effectiveness Research assists in determining how the funds should be used. The $300,000,000 remaining is available for AHRQ to support comparative effectiveness research (AHRQ, 2010; ARRA, 2009). In fiscal 2009 and 2010, these funds were accessible to AHRQ's to use as mandated in the Recovery Act (ARRA, 2009; HHS, 2010).

| | | |
|---|---|---|
| **2010** | Congressional appropriations | 0. |
| | Medicare trust fund | 0. |
| | PHS evaluation fund | 372,053,000. |
| | **TOTAL** | **$372,053,000.** |
| **2011** | **TOTAL ESTIMATE** | **$610,912,000.** |

(Sources: AHRQ, 2010; ARRA, 2009; HHS, 2010.)

## Table 2:

## Evidence-Based Practice Centers & Topics

- BLUE CROSS AND BLUE SHIELD ASSOCIATION, TECHNICAL EVALUATION CENTER (TEC), CHICAGO, IL
  - Testosterone suppression treatment for prostatic cancer—1997
  - Use of erythropoietin in hematology and oncology—1998
  - Management of chronic asthma—1999
  - Role of clinical practice in Endoscopic Retrograde Cholangiopancreatopography—2001
  - Evaluating breast cancer / PET, Technology Assessment—2001
- DUKE UNIVERSITY, DURHAM, NC
  - Evaluation of cervical cytology—1997
  - Management of acute chronic obstructive pulmonary disease—1998
  - Treatment of pulmonary disease following spinal cord injury—1999
  - Treatment of fibroids—1999
  - Post-term Pregnancy, Management—2000
  - Evidence-based Center, Russia—2000
  - Seasonal allergies effect on working populations—2001
  - Alzheimer's disease and dementia / PET, Technology Assessment—2001
- ECRI, PLYMOUTH MEETING, PA
  - Diagnosis and treatment of dysphagia/swallowing problems in the elderly—1997
  - Criteria for determining disability in patients with end-stage renal disease—1998
  - Treatment of degenerative lumbar spinal stenosis—1999
  - Repetitive motion disorders, diagnosis and treatment—2000
  - Pressure Ulcers and Air-fluidized Beds Treatment in a Home Environment—2001
  - Treatment-resistant epilepsy—2001
- JOHNS HOPKINS UNIVERSITY, BALTIMORE, MD
  - Evaluation and treatment of new onset of atrial fibrillation in the elderly
  - Treatment of acne—1998
  - Anesthesia management during cataract surgery—1998
  - Treatment of coexisting cataract and glaucoma—1999
  - Bioterrorism: Training for a rare public health event—2000
  - Blood pressure monitoring outside of a clinic setting—2000
  - Management of hepatitis C—2001
  - Management of venous thrombosis—2001
  - Use of glycohemoglobin and microabuminuria in diagnosis and monitoring diabetes mellitus—2001
- MCMASTER UNIVERSITY, HAMILTON, ONTARIO, CANADA
  - Treatment of attention deficit/hyperactivity disorder—1997
  - Criteria for weaning from mechanical ventilation—1998
  - Management of neurogenic/neuropathic pain following spinal, cord injury—1999
  - Impact of cancer-related aids
  - Diffusion and dissemination of evidence-based cancer control interventions – 2001
- METAWORKS, INC., BOSTON, MA
  - Diagnosis of sleep apnea—1997
  - Criteria for the referral of patients with epilepsy—1999
  - Management of breast disease—1999
  - Parkinson's Disease, diagnosis and management—2000
  - Direct patient access to audiology services, technology assessment—2001
  - Medical and scientific research related to disability from chronic fatigue syndrome—2001

## Table 2 (Continued):

## Evidence-Based Practice Centers & Topics

- NEW ENGLAND MEDICAL CENTER, BOSTON, MA
  - Diagnosis and treatment of acute bacterial sinusitis—1997
  - Management of cancer pain—1998
  - Evaluation of technologies for identifying acute cardiac ischemia in the emergency department—1999
  - Evaluation of Quality Components Used to Assess RTCs—1999
  - Criteria to determine disability of Infant/Childhood Impairments—2000
  - Management of allergic rhinitis—2000
  - Liver transplantation, Technology Assessment—2001
  - Hyperbaric oxygen therapy, Technology Assessment—2001
  - Pre-operative services, Technology Assessment—2001
  - Thyroid cancer / PET, Technology Assessment —2001
  - Management of clinically inapparent adrenal mass—2001
  - Management of cancer-associated pain and related symptoms: quality of life—2001
  - Neonatal hyperbilirubinemia—2001
- OREGON HEALTH SCIENCES UNIVERSITY, PORTLAND, OR
  - Rehabilitation of persons with traumatic brain injury—1997
  - Diagnosis and management of osteoporosis—1999
  - Medical informatics and telemedicine coverage under the Medicare program—1999
  - Stroke, Effectiveness and Cost-Effectiveness of Echocardiography and Carotid Ultrasound in Evaluation and Management—2000
  - Hyperbaric Oxygen therapy as treatment for brain injury and stroke—2001
  - Preventing adolescent criminal and other health-risking social behavior—2001
  - Technical support of U.S. Preventative Services Task Force—2001
  - Vaginal birth following C-Section—2001
  - Actinic Keratoses, Technology Assessment—2001
  - Healthcare Working Conditions and Patient Safety—2001
- RESEARCH TRIANGLE INSTITUTE AND UNIVERSITY OF NORTH CAROLINA CHAPEL HILL, NC
  - Pharmacotherapy for alcohol dependence—1997
  - Management of pre-term labor—1998
  - Efficacy of behavioral dietary interventions to reduce cancer risk—1998
  - Technical Support for the U.S. Preventative Services Task Force—1998
  - EPC technical support for the National Institute of Dental and Craniofacial Research—1999
  - Methods to rate the strength of scientific evidence—2000
  - Criteria to determine speech / language disorders—2000
  - Technical support for the U.S. Preventative Services Task Force—2001
  - Technical support of the National Center for Dental and Craniofacial Research—2001
  - Management of bronchiolitis—2001

## Table 2 (Continued):

## Program I: Evidence-Based Practice Centers & Topics

- SOUTHERN CALIFORNIA EVIDENCE-BASED PRACTICE CENTER—RAND, SANTA MONICA, CA
  - Prevention and Management of urinary complications in paralyzed persons—1997
  - Management of acute otitis media—1998
  - Prevention of venous thromboembolism after injury—1998
  - Otitis media with effusion—1999
  - EPC Technical Support for the National Center for Complementary and Alternative Medicine—1999
  - Utilization of physician services—2000
  - Diagnosis and treatment of congestive heart failure, technical support for NCCAM—2001
- UNIVERSITY OF CALIFORNIA, SAN FRANCISCO AND STANFORD UNIVERSITY, STANFORD, CA
  - Management of stable angina—1997
  - Management of unstable angina—1998
  - Refinement of HCUP Quality Indicators—1999
  - Autopsy as ultimate outcome measure—2000
  - Bioterrorism: Role of decision support systems in disease management following a bioterrorism event—2000
  - Management of Coronary Heart Disease in Women (Phase I) —2001
  - Critical analysis of patient safety practices: making health care safer—2001
- UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER, AN ANTONIO, TX
  - Depression treatment with new drugs—1997
  - Management of chronic hypertension during pregnancy—1998
  - Use of garlic for cardiovascular disease—1999
  - Use of silybum marianum in treatment of liver disease and cirrhosis—1999
  - Medical Harms Workshop—2000
  - Defining and managing chronic fatigue syndrome—2000

Source: AHRQ Publication No. 03-P006 &
EPC Program I Work Document: EPCs and Topics 1997-2001

**Table 3:**

**Propositions and Hypotheses**

| | |
|---|---|
| Proposition 1: | The high degree of coercive control over AHRQ that Congress exerted will be associated with relatively lower levels of program effectiveness. |
| Hypothesis 1: | A more centralized network in which the actors of Program I worked will be associated with higher levels of effectiveness. |
| Hypothesis 2: | A more complex network in which the EPC Program operated will be associated with lower levels of effectiveness. |
| Hypothesis 3: | Weaker ties among the actors that operated in Program I will be related to lower levels of effectiveness. |
| Proposition 2: | An increase in the funding in each fiscal year will be associated with greater EPC Program I effectiveness. |
| Proposition 3: | The EPC Program's use of catalytic control will be associated with higher levels of program effectiveness. |

**Table 4:**

**EPC Program I: Categories and Numbers of Topics Selected**

| CLINICAL CATEGORIES | TOPICS SELECTED *n* |
|---|---|
| Cardiovascular | 12 |
| Complementary and Alternative Care | 3 |
| Dermatology | 1 |
| Endocrinology | 1 |
| Gynecology | 7 |
| Health Care Services | 5 |
| Hematology | 9 |
| Methodology | 1 |
| Musculoskeletal | 4 |
| Nephrology | 1 |
| Neurology | 10 |
| Ophthalmology | 2 |
| Oral and Gastrointestinal | 4 |
| Otolaryngology, Respiratory and Allergic | 11 |
| Pathology | 1 |
| Psychiatry and Substance Abuse | 2 |
| Topics Not Categorized | 19 |
| **TOTAL** | **93** |

Source: Adapted from *Evidence-based Practice Centers Overview*. September 2001. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/clinic/epc/ Retrieved October 1, 2001

**Table 5:**

**Selected Topics by the Numbers Partners**

| PARTNERS | TOTAL TOPICS | |
|---|---|---|
| ***n*** | ***n*** | **%** |
| 1 | 71 | 76.3 |
| 2 | 12 | 12.9 |
| 3 | 5 | 5.4 |
| 4 | 1 | 1.1 |
| 6 | 3 | 3.2 |
| 11 | 1 | 1.1 |
| **TOTAL** | **93** | **100** |

**Table 6:**

**Topics Selected by Degree of Network Complexity and Numbers of Partners**

| PARTNERS | TOTAL TOPICS | |
|---|---|---|
| ***n*** | ***n*** | **%** |
| One<br>Less Complexity | 71 | 76.3 |
| More than One<br>2 to 11<br>More Complexity | 12 | 23.7 |
| **TOTAL** | 93 | 100 |

**Table 7:**

**Selected Topics by Numbers of Regions**

| REGIONS | TOTAL TOPICS | |
|---|---|---|
| ***n*** | ***n*** | **%** |
| 1 | 7 | 7.5 |
| 2 | 70 | 75.3 |
| 3 | 12 | 12.9 |
| 4 | 2 | 2.2 |
| 5 | 2 | 2.2 |
| **TOTAL** | **93** | **100** |

**Table 8:**

**Topics Selected by Degree of Network Complexity and Numbers of Regions**

| REGIONS | TOTAL TOPICS | |
|---|---|---|
| ***n*** | ***n*** | **%** |
| One<br>Less Complexity | 7 | 7.5 |
| More than One<br>2 to 5<br>More Complexity | 86 | 92.5 |
| **TOTAL** | **93** | **100** |

**Table 9:**

**Program I Total Selected Topics by Numbers of Sectors**

| SECTORS | TOTAL TOPICS | |
|---|---|---|
| ***n*** | ***n*** | **%** |
| One<br>Less Complexity<br>(Public) | 11 | 11.8 |
| More than One<br>More Complexity<br>(Public and Private) | 82 | 88.2 |
| **TOTAL** | **93** | **100** |

**Table 10:**

**Selected Topics by Numbers of Levels of Government**

| LEVELS | TOTAL TOPICS | |
|---|---|---|
| ***n*** | ***n*** | **%** |
| 1 (National) | 53 | 57 |
| 2 (National and State) | 37 | 39.8 |
| 3 (National, State and Local) | 3 | 3.2 |
| **TOTAL** | **93** | **100** |

**Table 11:**

**Selected Topics by Degree of Complexity and Numbers of Levels of Government**

| LEVELS | TOTAL TOPICS | |
|---|---|---|
| ***n*** | ***n*** | **%** |
| One (National) Less Complexity | 53 | 57 |
| More than One (National and State; and, National, State and Local) More Complexity | 40 | 43 |
| **TOTAL** | **93** | **100** |

**Table 12:**

**Numbers of Selected Topics and Nominators by Fiscal Year**

| FISCAL YEARS | TOTAL TOPICS SELECTED | NOMINATORS PER TOPIC |
|---|---|---|
| | ***n*** | ***n*** |
| 1997 | 12 | 30 |
| 1998 | 12 | 25 |
| 1999 | 19 | 23 |
| 2000 | 18 | 21 |
| 2001 | 32 | 44 |
| **TOTAL** | **93** | **143** |

**Table 13:**

**Selected Topics by Clinical Categories and Fiscal Years**

| CLINICAL CATEGORIES | FY 1997 | FY 1998 | FY 1999 | FY 2000 | FY 2001 | TOTAL |
|---|---|---|---|---|---|---|
| Cardiovascular | 2 | 3 | 1 | 3 | 3 | 12 |
| Complementary and Alternative Care | 0 | 0 | 2 | 0 | 1 | 3 |
| Dermatology | 0 | 1 | 0 | 0 | 0 | 1 |
| Endocrinology | 0 | 0 | 0 | 0 | 1 | 1 |
| Gynecology/Obstetrics and Neonatal | 1 | 1 | 1 | 2 | 2 | 7 |
| Health Care Services | 0 | 0 | 1 | 2 | 2 | 5 |
| Hematology and Oncology | 1 | 2 | 2 | 1 | 3 | 9 |
| Methodology | 0 | 0 | 0 | 1 | 0 | 1 |
| Musculoskeletal | 0 | 0 | 1 | 2 | 1 | 4 |
| Nephrology | 0 | 1 | 0 | 0 | 0 | 1 |
| Neurology | 4 | 0 | 3 | 1 | 2 | 10 |
| Ophthalmology | 0 | 1 | 1 | 0 | 0 | 2 |
| Oral and Gastrointestinal | 1 | 0 | 1 | 0 | 2 | 4 |
| Otolaryngology, Respiratory, and Allergic | 1 | 3 | 3 | 2 | 2 | 11 |
| Pathology | 0 | 0 | 0 | 1 | 0 | 1 |
| Psychiatry and Substance Abuse | 2 | 0 | 0 | 0 | 0 | 2 |
| Topics not Categorized | 0 | 0 | 3 | 3 | 13 | 19 |
| **TOTAL** | **12** | **12** | **19** | **18** | **32** | **93** |

**Table 14:**

**Topics Translated into Products**[122]

| CLINICAL CATEGORIES | TOPICS *n* | PRODUCTS *n* | PRODUCTS TO TOPICS RATIO |
|---|---|---|---|
| Cardiovascular | 12 | 29 | 2.42 |
| Complementary and Alternative Care | 3 | 5 | 1.67 |
| Dermatology | 1 | 1 | 1 |
| Endocrinology | 1 | 1 | 1 |
| Gynecology/Obstetrics and Neonatal | 7 | 11 | 1.57 |
| Health Care Services | 5 | 6 | 1.2 |
| Hematology and Oncology | 9 | 22 | 2.44 |
| Methodology | 1 | 1 | 1 |
| Musculoskeletal | 4 | 9 | 2.25 |
| Nephrology | 1 | 2 | 2 |
| Neurology | 10 | 15 | 1.5 |
| Ophthalmology | 2 | 11 | 5.5 |
| Oral and Gastrointestinal | 4 | 18 | 4.5 |
| Otolaryngology, Respiratory and Allergic | 11 | 32 | 2.91 |
| Pathology | 1 | 2 | 2 |
| Psychiatry and Substance Abuse | 2 | 4 | 2 |
| Topics not Categorized | 19 | 22 | 1.16 |
| **TOTAL** | **93** | **191** | **2.05** |

[122] The terms "product" and "translation" are used interchangeably to refer a partner or EPC translation of an evidence report generated during Program I.

**Table 15:**

**Translated Evidence Reports by Clinical Categories and Numbers of Partner and EPC Translations**

| Clinical Categories | Topics | Translations Partner | Translations EPC | Total Translations |
|---|---|---|---|---|
| | *n* | *n* | *n* | *n* |
| Cardiovascular | 12 | 11 | 18 | 29 |
| Complementary and Alternative Care | 3 | 3 | 2 | 5 |
| Dermatology | 1 | 0 | 1 | 1 |
| Endocrinology | 1 | 0 | 1 | 1 |
| Gynecology/Obstetrics and Neonatal | 7 | 3 | 8 | 11 |
| Health Care Services | 5 | 0 | 6 | 6 |
| Hematology and Oncology | 9 | 9 | 13 | 22 |
| Methodology | 1 | 0 | 1 | 1 |
| Musculoskeletal | 4 | 4 | 5 | 9 |
| Nephrology | 1 | 1 | 1 | 2 |
| Neurology | 10 | 3 | 12 | 15 |
| Ophthalmology | 2 | 2 | 9 | 11 |
| Oral and Gastrointestinal | 4 | 9 | 9 | 18 |
| Otolaryngology, Respiratory, and Allergic | 11 | 10 | 22 | 32 |
| Pathology | 1 | 0 | 2 | 2 |
| Psychiatry and Substance Abuse | 2 | 0 | 4 | 4 |
| Topics not Categorized | 19 | 10 | 12 | 22 |
| **Total** | **93** | **65** | **126** | **191** |

**Table 16:**

**Time[123] Taken to Translate Evidence Reports by Clinical Categories and Translator**

| CLINICAL CATEGORIES | TOPICS | TRANSLATIONS PARTNER | TRANSLATIONS EPC | TOTAL TIME |
|---|---|---|---|---|
| | *n* | *n* | *n* | *n* |
| Cardiovascular | 12 | 18 | 2 | 10 |
| Complementary and Alternative Care | 3 | 27 | 10 | 19 |
| Dermatology | 1 | - | 8 | 8 |
| Endocrinology | 1 | - | 11 | 11 |
| Gynecology/Obstetrics and Neonatal | 7 | 35 | 19 | 27 |
| Health Care Services | 5 | - | 10 | 10 |
| Hematology and Oncology | 9 | 4 | 20 | 12 |
| Methodology | 1 | - | 22 | 22 |
| Musculoskeletal | 4 | - 10 | 32 | 11 |
| Nephrology | 1 | 3 | 10 | 7 |
| Neurology | 10 | 28 | 16 | 22 |
| Ophthalmology | 2 | - 11 | -7 | -9 |
| Oral and Gastrointestinal | 4 | 10 | 13 | 12 |
| Otolaryngology, Respiratory, and Allergic | 11 | 15 | 6 | 11 |
| Pathology | 1 | - | 18 | 18 |
| Psychiatry and Substance Abuse | 2 | - | 9 | 9 |
| Topics not Categorized | 19 | NA | NA | NA |
| **TOTAL** | **93** | **11.9** | **12.44** | **12.5** |

[123] Time is measured in the number of months beginning from completion of the evidence report to publication of the derivative product (translation).

**Table 17:**

**Products with Accelerated[124] Time to Translation by Categories**

| CLINICAL CATEGORIES | TOTAL PRODUCTS | PRODUCTS WITH ACCELERATED TIME TO TRANSLATION | |
|---|---|---|---|
| | ***n*** | ***n*** | **%** |
| Cardiovascular | 29 | 18 | 62 |
| Complementary and Alternative Care | 5 | 1 | 20 |
| Dermatology | 1 | 0 | 0 |
| Endocrinology | 1 | 0 | 0 |
| Gynecology/Obstetrics and Neonatal | 11 | 0 | 0 |
| Health Care Services | 6 | 2 | 33 |
| Hematology and Oncology | 22 | 3 | 14 |
| Methodology | 1 | 0 | 0 |
| Musculoskeletal | 9 | 4 | 44 |
| Nephrology | 2 | 0 | 0 |
| Neurology | 15 | 4 | 27 |
| Ophthalmology | 11 | 10 | 91 |
| Oral and Gastrointestinal | 18 | 5 | 28 |
| Otolaryngology, Respiratory, and Allergic | 32 | 8 | 25 |
| Pathology | 2 | 0 | 0 |
| Psychiatry and Substance Abuse | 4 | 1 | 25 |
| Topics not Categorized | 22 | NA | NA |
| **TOTAL** | **191** | **56** | **33%** |

[124] I use the term "accelerated" in this context to refer to a translation of an evidence report that was published before the evidence report from which it was derived was released to the public.

**Table 18:**

**Disseminated Derivative Products by Clinical Categories and Disseminators**

| Clinical Categories | Partner/ EPC Products | Links[125] to Products | | Total Links to Products | Median Links Per Product |
|---|---|---|---|---|---|
| | | Partner | EPC | | |
| | *n* | *n* | *n* | *n* | *n* |
| Cardiovascular | 29 | 581 | 677 | 1258 | 64.5 |
| Complementary Alternative Care | 5 | 13 | 18 | 31 | 5 |
| Dermatology | 1 | - | 15 | 15 | NA |
| Endocrinology | 1 | - | 58 | 54 | NA |
| Gynecology/ Obstetrics, and Neonatal | 11 | 348 | 343 | 691 | 61 |
| Health Care Services | 6 | - | 189 | 189 | 33 |
| Hematology and Oncology | 22 | 359 | 365 | 724 | 40 |
| Methodology | 1 | - | 20 | 20 | NA |
| Musculoskeletal | 9 | 46 | 65 | 111 | NA |
| Nephrology | 2 | 42 | 31 | 73 | NA |
| Neurology | 15 | 176 | 399 | 615 | 29 |
| Ophthalmology | 11 | 82 | 112 | 218 | 97 |
| Oral and Gastrointestinal | 18 | 172 | 185 | 357 | 42 |
| Otolaryngology, Respiratory, and Allergi | 32 | 268 | 684 | 932 | 110.5 |
| Pathology | 2 | - | 46 | 46 | NA |
| Psychiatry and Substance Abuse | 4 | - | 376 | 376 | NA |
| Topics not Categorized | 22 | 56 | 888 | 944 | 21.5 |
| **Total** | **191** | **2,143** | **4,471** | **6,614** | **40** |

[125] In this column are the total number of links to products that were available from the 156 websites and databases. Many of the same partners (such as the American Academy of Family Physicians), journals (e.g., *American Family Physician*), and major health care databases (e.g., PubMed and the National Guideline Clearinghouse) posted links to the derivative products in the clinical categories.

**Table 19:**

**Numbers of Subscriptions and Disseminating Journals**

| JOURNALS | ANNUAL SUBSCRIPTIONS |
|---|---|
| | ***n*** |
| *Academic Radiology* | 4,400 |
| *Alternative Therapies in Health and Medicine* | 12,000 |
| *American Academy of Pediatrics: Grand Rounds* | Unspecified |
| *American Association of Advanced Critical-Care Nurses: Clinical Care* | Unspecified |
| *American Family Physician* | 190,948 |
| *American Journal of Epidemiology* | 4,900 |
| *American Journal of Obstetrics & Gynecology* | 13,804 |
| *American Journal of Ophthalmology* | 12,385 |
| *American Journal of Preventive Medicine* | 3,220 |
| *American Journal of Respiratory & Critical Care Medicine* | 20,000 |
| *Annals of Emergency Medicine* | 27,223 |
| *Annals of Internal Medicine* | 97,000 |
| *Archives of Pediatrics & Adolescent Medicine* | 30,900 |
| *Archives of Physical Medicine & Rehabilitation* | 10,700 |
| *Archives of Surgery* | 21,000 |
| *BioMed Central: Medical Informatics and Decision Making* | 35,000 |
| *Birth* | 3,500 |
| *Blood* | 13,835 |
| *British Journal of Obstetrics & Gynecology* | 6,400 |
| *British Medical Journal* | 139,000 |
| *Canadian Journal of Psychiatry* | 3,500 |
| *Cancer* | 10,116 |
| *Care Management Journals* | Unspecified |
| *Chest: The Cardiopulmonary and Critical Care Journal* | 23,000 |
| *The Cochrane Library* | Unspecified |
| *Community Dentistry and Oral Epidemiology* | 900 |
| *Current Atherosclerosis Reports* | Unspecified |
| *Disability and Rehabilitation* | Unspecified |
| *Dysphagia: An International Multidisciplinary Journal Devoted to Swallowing* | Unspecified |
| *Evidence-based Medicine* | Unspecified |
| *Gastroenterology* | 17,081 |
| *Gastrointestinal Endoscopy* | 10,228 |
| *Hepatology* | 5,718 |
| *Inquiry* | 1,200 |
| *International Journal for Quality in Health Care* | 1,500 |
| *Journal of Abnormal Child Psychology* | Unspecified |
| *Journal of the American Academy of Dermatology* | 18,875 |
| *Journal of the American College of Cardiology* | Unspecified |
| *JAMA: The Journal of the American Medical Association* | 543,337 |
| *Journal of Dental Education* | 4,143 |
| *Journal of Dental Research* | 7,237 |
| *The Journal of Family Practice* | 87,523 |

| | |
|---|---|
| *Journal of General Internal Medicine* | 3,000 |
| *Journal of Head and Trauma Rehabilitation* | 2,500 |
| *Journal of the National Cancer Institute* | 7,000 |
| *Journal of Pain and Palliative Care Pharmacotherapy* | 529 |
| *Journal of Rehabilitation Research and Development* | 27,000 |
| *Journal of Respiratory and Critical Care Medicine* | 20,000 |
| *Journal of Spinal Cord Medicine* | 1,500 |
| *Journal of Trauma: Injury, Infection, and Critical Care* | 11,489 |
| *Nutrition Journal* | Unspecified |
| *Obstetrics and Gynecology* | 44,950 |
| *Ophthalmology* | 25,498 |
| *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics* | 6,268 |
| *Osteoporosis International* | Unspecified |
| *Otolaryngology—Head and Neck Surgery* | 12,169 |
| *Pediatrics* | 64,000 |
| *PharmacoEconomics* | 1,200 |
| *Preventive Medicine* | Unspecified |
| *Quality and Safety in Health Care* | Unspecified |
| *Sleep* | 5,000 |
| *Southern Medical Journal* | 22,000 |
| *Spine* | 7,451 |
| *Statistics in Medicine* | 1,800 |
| *Urology* | 7,500 |
| *Women's Health Issues* | 3,000 |
| **TOTAL** | **1,654,427** |

(Source of Subscription Data: *Ulrich's Periodical Directory*, 2006.)

**Table 20:**

**Immediate Free Online Public Access to Products by Clinical Categories**

| CLINICAL CATEGORIES | PARTNER/ EPC PRODUCTS | IMMEDIATE FREE ONLINE PUBLIC ACCESS | |
|---|---|---|---|
| | ***n*** | ***n*** | **%** |
| Cardiovascular | 29 | 12 | 41 |
| Complementary and Alternative Care | 5 | 3 | 60 |
| Dermatology | 1 | 0 | 0 |
| Endocrinology | 1 | 0 | 0 |
| Gynecology/Neonatal and Obstetrics | 11 | 3 | 27 |
| Health Care Services | 6 | 1 | 17 |
| Hematology and Oncology | 22 | 10 | 45 |
| Methodology | 1 | 0 | 0 |
| Musculoskeletal | 9 | 2 | 22 |
| Nephrology | 2 | 1 | 50 |
| Neurology | 15 | 7 | 47 |
| Ophthalmology | 11 | 2 | 18 |
| Oral and Gastrointestinal | 18 | 5 | 27 |
| Otolaryngology, Respiratory, and Allergic | 32 | 11 | 34 |
| Pathology | 2 | 0 | 0 |
| Psychiatry and Substance Abuse | 4 | 0 | 0 |
| Topics not Categorized | 22 | 9 | 41 |
| **TOTAL** | **191** | **66** | **34** |

**Table 21:**

**Degree of Free Online Access to Products by Clinical Categories**

| | | *Free Online Public Access* | | | | | |
|---|---|---|---|---|---|---|---|
| **CLINICAL CATEGORIES** | **PARTNER/ EPC PRODUCTS** | **IMMEDIATELY** | | **6 MONTHS AFTER PUBLICATION** | | **12 MONTHS AFTER PUBLICATION** | |
| | ***n*** | ***n*** | **%** | ***n*** | **%** | ***n*** | **%** |
| Cardiovascular | 29 | 12 | 41 | 14 | 48 | 14 | 48 |
| Complementary and Alternative Care | 5 | 3 | 60 | 3 | 60 | 3 | 60 |
| Dermatology | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Endocrinology | 1 | 0 | 0 | 1 | 100 | 1 | 100 |
| Gynecology/Obstetrics and Neonatal | 11 | 3 | 27 | 4 | 36 | 4 | 36 |
| Health Care Services | 6 | 1 | 17 | 2 | 33 | 3 | 50 |
| Hematology and Oncology | 22 | 10 | 45 | 11 | 50 | 11 | 50 |
| Methodology | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Musculoskeletal | 9 | 2 | 22 | 4 | 44 | 4 | 44 |
| Nephrology | 2 | 1 | 50 | 1 | 50 | 1 | 50 |
| Neurology | 15 | 7 | 47 | 7 | 47 | 7 | 47 |
| Ophthalmology | 11 | 2 | 18 | 3 | 27 | 3 | 27 |
| Oral and Gastrointestinal | 18 | 5 | 27 | 6 | 33 | 6 | 33 |
| Otolaryngology, Respiratory and Allergic | 32 | 11 | 34 | 12 | 38 | 14 | 45 |
| Pathology | 2 | 0 | 0 | 1 | 50 | 1 | 50 |
| Psychiatry and Substance Abuse | 4 | 0 | 0 | 4 | 100 | 4 | 100 |
| Topics not Categorized | 22 | 9 | 41 | 12 | 55 | 12 | 55 |
| **TOTAL** | **191** | **66** | **35** | **85** | **45** | **88** | **46** |

**Table 22:**

**Journals by Degree of Public Access**

| JOURNALS | FREE ACCESS IN ELECTRONIC FORM: IMMEDIATELY | FREE ACCESS IN ELECTRONIC FORM: 6 MONTHS AFTER PUBLICATION | FREE ACCESS IN ELECTRONIC FORM: 12 MONTHS AFTER PUBLICATION | NOT ACCESSIBLY FREE IN ELECTRONIC OR PAPER FORM |
|---|---|---|---|---|
| *Academic Radiology* | | | | ✓ |
| *Alternative Therapies in Health and Medicine* | | | | ✓ |
| *American Academy of Pediatrics: Grand Rounds* | | | | ✓ |
| *American Association of Advanced Critical-Care Nurses: Clinical Care* | | | | ✓ |
| *American Family Physician* | ✓ | | | |
| *American Journal of Epidemiology* | | | | ✓ |
| *American Journal of Obstetrics & Gynecology* | | | | ✓ |
| *American Journal of Ophthalmology* | | | | ✓ |
| *American Journal of Preventive Medicine* | | | | ✓ |
| *American Journal of Respiratory & Critical Care Medicine* | | | ✓ | |
| *Annals of Emergency Medicine* | | | | ✓ |
| *Annals of Internal Medicine* | | ✓ | | |
| *Archives of Pediatrics & Adolescent Medicine*[126] | | | ✓ | |
| *Archives of Physical Medicine & Rehabilitation* | | | | ✓ |
| *Archives of Surgery* | | | | ✓ |
| *BioMed Central: Medical Informatics and Decision Making* | ✓ | | | |
| *Birth* | | | | ✓ |
| *Blood* | | | | ✓ |
| *British Journal of Obstetrics & Gynecology* | | | | ✓ |
| *British Medical Journal* | ✓ | | | |
| • Danish language edition | | | | |
| • Dutch language edition | | | | |
| • Chinese language edition | | | | |
| • English language edition | | | | |
| • Greek language edition | | | | |
| • Hungarian language edition | | | | |
| • Polish language edition[127] | | | | |

[126] *Archives of Pediatrics & Adolescent Medicine* offered electronic articles without a monetary fee 12 months after publication to individuals who registered with the journal (*Archives of Pediatrics & Adolescent Medicine,* 2006*)*. There was not a fee with this type of registration (Ibid.)

[127] The *British Medical Journal* was published in Polish from 1994 to 2003 (Ulrich's Periodical Directory Database, 2006).

| | | | |
|---|---|---|---|
| • Portuguese language edition | | | |
| • Romanian language edition | | | |
| • Spanish language edition | | | |
| *Canadian Journal of Psychiatry*[128] | ✓ | | |
| *Cancer* | | | ✓ |
| *Care Management Journals* | | | ✓ |
| *Chest: The Cardiopulmonary and Critical Care Journal* [129] | | | ✓ |
| *The Cochrane Collaboration Library* | | | |
| • *English language edition* | | | |
| • *Spanish language edition* | | | ✓ |
| *Community Dentistry and Oral Epidemiology* | | | ✓ |
| *Current Atherosclerosis Reports* | | | ✓ |
| *Disability and Rehabilitation* | | | ✓ |
| *Dysphagia: An International Multidisciplinary Journal Devoted to Swallowing and its Disorders* | | | ✓ |
| *Evidence-based Medicine* | ✓ | | |
| *Gastroenterology* | | | ✓ |
| *Gastrointestinal Endoscopy* | | | ✓ |
| *Hepatology* | | | ✓ |
| *Inquiry* | | | ✓ |
| *International Journal for Quality in Health Care* | | | ✓ |
| *Journal of Abnormal Child Psychology* | | | ✓ |
| *Journal of the American Academy of Dermatology* | | | ✓ |
| *Journal of the American College of Cardiology*[130] | | | ✓ |
| *JAMA: The Journal of the American Medical Association*[131] | | ✓ | |
| • Chinese language edition | | | |
| • English language edition | | | |
| • Italian language edition | | | |
| • German language edition | | | |
| • Portuguese language edition | | | |

[128] Editions of the *Canadian Journal of Psychiatry* were published in either English or French language; and articles appeared in the language in which they were submitted (*Canadian Journal of Psychiatry*, 2006). Program I products that appeared in the journal were published in English.

[129] A monetary fee was required to obtain access to the full text of articles that were published in *Chest: The Cardiopulmonary and Critical Care Journal* ("*Chest*" hereafter). However, the requirement of such a fee was not enforced. While determining the degree of access to products, without a subscription or paying a fee, I had full access to virtually any content that appeared in *Chest*. I contacted an administrative staff person at *Chest* to verify its policy (December, 2006). The staff person confirmed the fee for access requirement and asked a battery of questions including inquiry into my computer's IP address. Finally, the journal representative documented that its fee requirement was not in this case being technically enforced and was an error on its part (Ibid.).

[130] Public access to articles published in the *Journal of the American College of Cardiology* also required a fee. However, this requirement also was not technically enforced. Articles published in the journal were available without a fee or subscription throughout the study's data collection period, regardless of the publication year or whether the content was a derivative product from Program I.

[131] Six months after publication, online articles published in *JAMA: The Journal of the American Medical Association* ("*JAMA*" hereafter) were free to individuals who registered with the journal. There was not a fee for such registration (*JAMA*, 2006). This policy was enforced by the journal.

| | | | | |
|---|---|---|---|---|
| • Spanish language edition | | | | |
| *Journal of Dental Education* | | | | ✓ |
| *Journal of Dental Research* | | | | ✓ |
| *The Journal of Family Practice* | | | | ✓ |
| *Journal of General Internal Medicine* | | | | ✓ |
| *Journal of Head and Trauma Rehabilitation* | | | | ✓ |
| *Journal of the National Cancer Institute*[132] | ✓ | | | |
| *Journal of Pain and Palliative Care* | | | | |
| *Pharmacotherapy* | | | | ✓ |
| *Journal of Rehabilitation Research and Development*[133] | ✓ | | | |
| *Journal of Respiratory and Critical Care Medicine* | | | | ✓ |
| *Journal of Spinal Cord Medicine* | | | | ✓ |
| *Journal of Trauma: Injury, Infection, and Critical Care* | | | | ✓ |
| *Nutrition Journal* | ✓ | | | |
| *Obstetrics and Gynecology* | | | | ✓ |
| *Ophthalmology* | | | | ✓ |
| *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontics* | | | | ✓ |
| *Osteoporosis International* | | | | ✓ |
| *Otolaryngology—Head and Neck Surgery* | | | | ✓ |
| *Pediatrics*[134] | | | | |
| • English language edition | | | | ✓ |
| • Spanish language edition | | | | |
| *PharmacoEconomics* | | | | ✓ |
| *Preventive Medicine* | | | | ✓ |
| *Quality and Safety in Health Care* | | | | ✓ |
| *Sleep* | | | | ✓ |
| *Southern Medical Journal* | | | | ✓ |
| *Spine* | | | | ✓ |
| *Statistics in Medicine* | | | | ✓ |
| *Urology* | | | | ✓ |
| *Women's Health Issue* | | | | ✓ |
| **TOTAL** | **8** | **2** | **2** | **54** |

(Source of Subscription Data: *Ulrich's Periodical Directory*, 2006

[132] Selected contents of the *Journal of the National Cancer Institute* were available electronically free of charge, and each EPC Program I product that the journal published was fully accessible without a fee.

[133] The print edition of the *Journal of Rehabilitation Research & Development*, in paper form, also was free, but only to qualified personnel (*Journal of Rehabilitation Research & Development*, 2006).

[134] While determining public access to products published in *Pediatrics*, I obtained full access to the contents of *Pediatrics* for free. However, obtaining public access to its contents free of charge did not coincide with the journal's subscription policy. For the purpose of clarification, I contacted a staff representative at *Pediatrics*. As in the case of *Chest* and the *Journal of the American College of Cardiology* I was told that the journal was not free and that I should only be able to access the journal's contents if I paid a fee (for each individual article or a subscription membership) or if the location from which I was accessing the article had done so (December 2006).

**Table 23:**

**Statutory Deadlines**

| OBJECTIVES | FISCAL YEARS | COMPLIANCE YES | COMPLIANCE NO |
|---|---|---|---|
| Report on the methods that AHRQ and its contractors use to rate the evidence in developing evidence reports and technical assessments | 2000 | | ✓ |
| Conduct a national survey on the cost and use of health care for the Trends in Quality and Cost report | 2001 | ✓ | |
| | 2002 | ✓ | |
| | 2003 | ✓ | |
| | 2004 | ✓ | |
| | 2005 | ✓ | |
| Collect any outcome measurements generally gathered by private accreditation organizations for the Medical and Survey Expenditure Panel Data | 2001 | ✓ | |
| Expand National Medical Survey Expenditure Panel Data to be used for in the Trends in Quality and Cost Report | 2001 | ✓ | |
| | 2002 | ✓ | |
| | 2003 | ✓ | |
| | 2004 | ✓ | |
| | 2005 | ✓ | |
| Report on the Disparities in Health Care Delivery | 2003 | ✓ | |
| | 2004 | ✓ | |
| | 2005 | ✓ | |
| Report on the National Trends in Quality of Healthcare Provided to the American People | 2003 | ✓ | |
| | 2004 | ✓ | |
| | 2005 | ✓ | |
| TOTAL | 18 | 17 | 1 |

(Sources: AHRQ, 1997, 1998, 1999, 2000, 2001, 2002, 2003; U.S. Public Law 106-129.)

**Table 24:**

**Network Activities Coordinated**

| ACTIVITIES COORDINATED BY THE EPC OFFICE[135] | NUMBERS OF TIMES |
|---|---|
| Distribute evidence report requests for proposals to each of the 12 EPCs | 1116 |
| Coordinate EPC topic and partner assignments for the evidence report | 236 |
| Assign evidence report task orders to EPCs | 93 |
| Assign a task order officer to oversee the work of the EPC and partner on the evidence report | 93 |
| Distribute AHRQ's EPC Directors' conference and EPC conference information to the EPCs | 216 |
| Distribute the names of journal symposia and contact information to the EPCs for possible product publication | 2 |
| **TOTAL** | **1756** |

(Sources: AHRQ, 2000; Background Information, 2005; EPC J Archives, 1997, 1998, 1999, 2000, 2001.)

[135] See Table 25 for the type of effectiveness (translation, dissemination, accessibility) that each activity tapped.

**Table 25:**

**Network Activities Coordinated by the EPC Office**

| *Activities* | Area of Activity | | | | Total Number of Times Coordinated |
|---|---|---|---|---|---|
| | Report Development | Translation | Dissemination | Accessibility | |
| Distribute evidence report RFPs to the 12 EPCs | • | | | | 1116 |
| Coordinate EPC Topic and partner assignment for the evidence report | • | • | • | • | 236 |
| Assign task orders to EPCs | • | | | | 93 |
| Assign a task order officer to oversee the work of drafting the evidence report | • | | | | 93 |
| Distribute AHRQ's EPC Directors' conference and EPC conference information | • | | | | 216 |
| Distribute journal symposium information to EPCs for possible product publication | | | • | • | 2 |
| **Total** | | | | | **1756** |

## Table 26:

## Effectiveness by Network Centralization

### *Effectiveness*

| | | TRANSLATION | | DISSEMINATION | ACCESSIBILITY | | | RELATIONSHIP | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Centralized Network*** | | Translations | Time | Links | Immediate Upon Publication | 6 Months After Publication | 12 Months After Publication | **Consistent** | **Inconsistent** | **TOTAL** |
| | PROGRAM I | *n* | *n* | *n* | *n* | *n* | *n* | *n* | *n* | *n* |
| Tasks organized by the EPC office | Partners | Consistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 4 | 2 | 6 |
| | EPCs | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | 6 |
| | Total | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | 6 |
| Funds distributed by the EPC office | Partners | Consistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 4 | 2 | 6 |
| | EPCs | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | 6 |
| | Total | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | 6 |
| *Consistent* | | 2 | 0 | 0 | 6 | 6 | 6 | 20 | - | 20 |
| *Inconsistent* | | 4 | 6 | 6 | 0 | 0 | 0 | - | 16 | 16 |
| **TOTAL** | | 6 | 6 | 6 | 6 | 6 | 6 | 20 | 16 | 36 |

**Table 27:**

**Network Complexity and Translation Effectiveness:**

**Numbers of Partners by Number of Products and Time**

| INDEPENDENT VARIABLE: NETWORK COMPLEXITY | | DEPENDENT VARIABLE: TRANSLATION | |
|---|---|---|---|
| NUMBERS OF PARTNERS | | NUMBER OF TRANSLATIONS | |
| | | | Somers' d Sig. |
| | Partners | .193 | .130 |
| | EPCs | .342 | .011 |
| | Total | .381 | .003 |
| NUMBERS OF PARTNERS | | TIME (MONTHS) | |
| | | | Somers' d Sig. |
| | Partners | .177 | .374 |
| | EPCs | -.211 | .209 |
| | Total | -.051 | .748 |

**Table 28:**

**Network Complexity and Dissemination Effectiveness:**

**Numbers of Partners and Links**

| INDEPENDENT VARIABLE: NETWORK COMPLEXITY | DEPENDENT VARIABLE: DISSEMINATION | |
|---|---|---|
| NUMBERS OF PARTNERS | NUMBERS OF LINKS | |
| | Somers' d | Sig. |
| Partners | .306 | .081 |
| EPCs | .512 | .000 |
| Total | .411 | .005 |

**Table 29:**

**Network Complexity and Accessibility Effectiveness:**

**Numbers of Partners and Free Online Products**

| Independent Variable: Network Complexity | | Dependent Variable: Accessibility | |
|---|---|---|---|
| Numbers of Partners | | Numbers of Free Products | |
| | | Somers' d | Sig. |
| Type of Access | | | |
| Immediate | Partners | .025 | .861 |
| | EPCs | -.061 | .553 |
| | Total | .007 | .945 |
| 6 Months after Publication | Partners | -.009 | .949 |
| | EPCs | -.081 | .574 |
| | Total | -.012 | .938 |
| 12 Months after Publication | Partners | -.009 | .949 |
| | EPCs | -.054 | .711 |
| | Total | .009 | .951 |

**Table 30:**

**Network Complexity and Translation Effectiveness:**

**Numbers of Translations and Time by Regions**

| Independent Variable: Network Complexity | Dependent Variable: Translation | |
|---|---|---|
| Numbers of Regions | Numbers of Products | |
| | Somers' d | Sig. |
| Partners | -.090 | .667 |
| EPCs | -.266 | .221 |
| Total | -.208 | .399 |
| Numbers of Regions | Time (months) | |
| | Somers' d | Sig. |
| Partners | .680 | .039 |
| EPCs | .291 | .186 |
| Total | .518 | .033 |

**Table 31:**

**Network Complexity and Dissemination Effectiveness: Links by Numbers of Regions**

| Independent Variable: Network Complexity | Dependent Variable: Dissemination | |
|---|---|---|
| Numbers of Regions | Numbers of Links | |
| | Somers' d | |
| | | Sig. |
| Partners | -.360 | .168 |
| EPCs | .083 | .708 |
| Total | -.122 | .562 |

**Table 32:**

**Network Complexity and Accessibility Effectiveness:**

**Free Online Products by Numbers of Regions**

| INDEPENDENT VARIABLE: NETWORK COMPLEXITY | | DEPENDENT VARIABLE: ACCESS | |
|---|---|---|---|
| NUMBERS OF REGIONS | | NUMBERS OF FREE PRODUCTS | |
| Type of Access | | | Somers' d Sig. |
| Immediately after Publication | Partners | .146 | .106 |
| | EPCs | .009 | .952 |
| | Total | -.015 | .946 |
| 6 Months after Publication | Partners | .171 | .089 |
| | EPCs | -.247 | .231 |
| | Total | -.197 | .377 |
| 12 Months after Publication | Partners | .171 | .089 |
| | EPCs | -.210 | .297 |
| | Total | -.169 | .439 |

**Table 33:**

**Network Complexity and Translation Effectiveness:**

**Number of Products and Time by Number of Sectors**

| INDEPENDENT VARIABLE: NETWORK COMPLEXITY | DEPENDENT VARIABLE: TRANSLATION | |
|---|---|---|
| NUMBERS OF SECTORS | NUMBERS OF PRODUCTS | |
| | | Somers' d |
| | | Sig. |
| Partners | .242 | .131 |
| EPCs | .175 | .107 |
| Total | .299 | .097 |
| | TIME (MONTHS) | |
| | | Somers' d |
| | | Sig. |
| Partners | -.486 | .320 |
| EPCs | -.480 | .140 |
| Total | -.504 | .096 |

**Table 34:**

**Network Complexity and Dissemination Effectiveness:**

**Product Links by Numbers of Sectors**

| INDEPENDENT VARIABLE: NETWORK COMPLEXITY | DEPENDENT VARIABLE: DISSEMINATION | |
|---|---|---|
| NUMBERS OF SECTORS | NUMBERS OF LINKS | |
| | Somers' d | Sig. |
| Partners | .373 | .278 |
| EPCs | .183 | .641 |
| Total | .340 | .200 |

**Table 35:**

**Network Complexity and Accessibility Effectiveness:**

**Free Products by Numbers of Sectors**

| INDEPENDENT VARIABLE: NETWORK COMPLEXITY | | DEPENDENT VARIABLE: ACCESS | |
|---|---|---|---|
| NUMBERS OF SECTORS | | NUMBERS OF FREE PRODUCTS | |
| *Access* | Program I | | Somers' d Sig. |
| Immediate | Partners | .143 | .143 |
| | EPCs | -.076 | .723 |
| | Total | .182 | .320 |
| 6 Months after Publication | Partners | .167 | .126 |
| | EPCs | -.174 | .548 |
| | Total | .134 | .463 |
| 12 Months after Publication | Partners | .167 | .126 |
| | EPCs | -.143 | .622 |
| | Total | .160 | .381 |

**Table 36:**

**Translated Products and Time by Network Complexity**

| INDEPENDENT VARIABLE: NETWORK COMPLEXITY | | DEPENDENT VARIABLE: TRANSLATION | |
|---|---|---|---|
| NUMBERS *of:* | | NUMBERS *of PRODUCTS* Somers' d | |
| | Program I | | Sig. |
| *PARTNERS* | Partners | .193 | .130 |
| | EPCs | .342 | .011 |
| | Total | .381 | .003 |
| *REGIONS* | Partners | -.090 | .667 |
| | EPCs | -.266 | .221 |
| | Total | -.208 | .399 |
| *SECTORS* | Partners | .242 | .131 |
| | EPCs | .175 | .107 |
| | Total | .299 | .097 |
| *LEVELS* | Partners | -.150 | .165 |
| | EPCs | .026 | .821 |
| | Total | -.051 | .661 |
| | | *TIME* (Months) Somers' d | |
| | | | Sig. |
| *PARTNERS* | Partners | .177 | .374 |
| | EPCs | -.211 | .209 |
| | Total | -.051 | .748 |
| *REGIONS* | Partners | .680 | .039 |
| | EPCs | .291 | .186 |
| | Total | .518 | .033 |
| *SECTORS* | Partners | -.486 | .320 |
| | EPCs | -.480 | .140 |
| | Total | -.504 | .096 |
| *LEVELS* | Partners | .140 | .505 |
| | EPCs | .184 | .239 |
| | Total | .175 | .228 |

**Table 37:**

**Network Complexity and Dissemination Effectiveness: Links by Numbers of Levels**

| INDEPENDENT VARIABLE: NETWORK COMPLEXITY | DEPENDENT VARIABLE: DISSEMINATION | |
|---|---|---|
| NUMBERS OF LEVELS | NUMBERS OF LINKS | |
| | | Somers' d |
| Program I | | Sig. |
| Partners | .140 | .411 |
| EPCs | .175 | .236 |
| Total | .153 | .254 |

**Table 38:**

**Network Complexity and Accessibility Effectiveness:**

**Free Online Products by Numbers of Levels**

| INDEPENDENT VARIABLE: NETWORK COMPLEXITY | | DEPENDENT VARIABLE: ACCESSIBILITY | |
|---|---|---|---|
| NUMBERS OF LEVELS | NUMBERS OF FREE PRODUCTS | | |
| | | | Somers' d |
| Type of Access | Program I | | Sig. |
| Immediate | Partners | -.289 | .002 |
| | EPCs | -.111 | .231 |
| | Total | -.288 | .011 |
| 6 Months after Publication | Partners | -.216 | .059 |
| | EPCs | -.112 | .378 |
| | Total | -.205 | .096 |
| 12 Months after Publication | Partners | -.216 | .059 |
| | EPCs | -.102 | .435 |
| | Total | -.195 | .118 |

## Table 39:

## Effectiveness by Network Complexity: Consistent and Inconsistent Findings

| | | ***Effectiveness*** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **TRANSLATION** | | **DISSEMINATION** | **ACCESSIBILITY** | | | **RELATIONSHIP** | | |
| ***Network Complexity*** | | Translations | Time | Links | Immediately after Publication | 6 months After Publication | 12 months after Publication | Consistent | Inconsistent | |
| | PROGRAM I | *n* | *n* | *n* | *n* | *n* | *n* | *n* | *n* | **TOTAL** |
| EPC Collaborative Component per Topic | Partners | Consistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 4 | 2 | 6 |
| | EPCs | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | 6 |
| | Total | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | 6 |
| Advisory and Peer-Review Panel Members per Topic | Partners | Consistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 4 | 2 | 6 |
| | EPCs | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | 6 |
| | Total | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | 6 |
| *Consistent* | | 2 | 0 | 0 | 6 | 6 | 6 | 20 | - | 20 |
| *Inconsistent* | | 4 | 6 | 6 | 0 | 0 | 0 | - | 16 | 16 |
| **TOTAL** | | 6 | 6 | 6 | 6 | 6 | 6 | 20 | 16 | 36 |

## Table 40:

## Effectiveness by Network Complexity:

## Consistent and Inconsistent Findings[136]

| | | *Effectiveness* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **TRANSLATION** | | **DISSEMINATION** | **ACCESSIBILITY** | | | **RELATIONSHIP** | | |
| ***Network Complexity Numbers of :*** | PROGRAM I | Translations | Time | Links | Immediate | 6 Months after Publication | 12 Months after Publication | Consistent | Inconsistent | **TOTAL** |
| | | *n* | *n* | *n* | *n* | *n* | *n* | *n* | *n* | |
| Partners | Partners | -- | -- | Inconsistent | -- | -- | -- | 0 | 1 | 1 |
| | EPCs | Inconsistent | -- | Inconsistent | -- | -- | -- | 0 | 2 | 2 |
| | Total | Inconsistent | -- | Inconsistent | -- | -- | -- | 0 | 2 | 2 |
| Regions | Partners | -- | -- | -- | -- | -- | -- | 0 | 0 | 0 |
| | EPCs | -- | Consistent | -- | -- | -- | -- | 1 | 0 | 1 |
| | Total | -- | Consistent | -- | -- | -- | -- | 1 | 0 | 1 |
| Sectors | Partners | -- | -- | -- | -- | -- | -- | 0 | 0 | 0 |
| | EPCs | -- | -- | -- | -- | -- | -- | 0 | 0 | 0 |
| | Total | Inconsistent | Inconsistent | -- | -- | -- | -- | 2 | 0 | 2 |
| Levels | Partners | -- | -- | -- | Consistent | Consistent | Consistent | 3 | 0 | 3 |
| | EPCs | -- | -- | -- | -- | -- | -- | 0 | 0 | 0 |
| | Total | -- | -- | -- | Consistent | Consistent | -- | 2 | 0 | 2 |
| Consistent | | 0 | 2 | 0 | 2 | 2 | 1 | 7 | - | 7 |
| Inconsistent | | 3 | 1 | 3 | 0 | 0 | 0 | - | 7 | 7 |
| **TOTAL** | | 3 | 3 | 3 | 2 | 2 | 1 | 7 | 7 | 14 |

[136] The dash symbol ("--") indicates that the relationships between the variables were not statistically significant.

## Table 41:

## Effectiveness by Tie Strength: Consistent and Inconsistent Findings[137]

| | | ***Effectiveness*** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **TRANSLATION** | | **DISSEMINATION** | | **ACCESSIBILITY** | | **RELATIONSHIP** | | |
| ***Strength of Ties*** | **PROGRAM I** | Translations | Time | Links | Immediate | 6 Months After | 12 Months After | **Consistent** | **Inconsistent** | **TOTAL** |
| | | *n* | *n* | *n* | *n* | *n* | *n* | *n* | *n* | *n* |
| Reference one another's work | Partners | Consistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 4 | 2 | **6** |
| | EPCs | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| | Total | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| Familiarity with EBM | Partners | Consistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 4 | 2 | **6** |
| | EPCs | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| | Total | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| Philosophical Orientations | Partners | Consistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 4 | 2 | **6** |
| | EPCs | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| | Total | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| Talking at medical association conferences | Partners | Consistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 4 | 2 | **6** |
| | EPCs | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| | Total | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| EPC staff of the 12 EPCs at medical association conferences | Partners | Consistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 4 | 2 | **6** |
| | EPCs | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| | Total | Inconsistent | Inconsistent | Inconsistent | Consistent | Consistent | Consistent | 3 | 3 | **6** |
| EPC Directors' Conferences and EPC Conferences | Partners | Inconsistent | Consistent | Consistent | Inconsistent | Inconsistent | Inconsistent | 2 | 4 | **6** |
| | EPCs | Consistent | Consistent | Consistent | Inconsistent | Inconsistent | Inconsistent | 3 | 3 | **6** |
| | Total | Consistent | Consistent | Consistent | Inconsistent | Inconsistent | Inconsistent | 3 | 3 | **6** |
| *Consistent* | | 7 | 3 | 3 | 15 | 18 | 18 | 68 | -- | **68** |
| *Inconsistent* | | 11 | 15 | 15 | 3 | 3 | 3 | -- | 58 | **58** |
| **TOTAL** | | **18** | **18** | **18** | **18** | **18** | **18** | **58** | **50** | **108** |

[137] The number of times the program actors talked to one another at medical association meetings prior to EPC Program I was the seventh measure of tie strength. Since the actors did not talk to one another at medical conferences prior to Program I, there were no ties among the actors as tapped by this measure. Therefore no relationship was found between this measure of tie strength and Program I effectiveness.

## Table 42:

## Required EPC Correspondence

**RESEARCH AND WRITING**

**TOPIC ASSESSMENT AND REFINEMENT**

- Conference call to clarify the schedule of work and goals and objectives
- Submit a preliminary work plan
- Teleconference to identify and refine three to five research questions for inclusion in the evidence report; and, experts/organizations that might be interested in translating the report and disseminating the derivative product
- Submit a preliminary assessment of the literature as it relates to the three to five identified research questions and possible audiences of the report

**LITERATURE REVIEW**

- Teleconference to discuss the literature review and inclusion criteria and criteria for rating the studies in literature
- Obtain approval on a work plan for the literature review and the inclusion and evaluation criteria
- Submit a summary on the findings from the literature review

**SYNTHESIS**

- Conference call to discuss a work plan for the synthesis phase
- Submit and obtain approval on a work plan for the synthesis

**REPORTING**

- Send the evidence report draft
- Submit the peer-review comments and the report on the disposition of comments
- Send the final draft of the evidence report
- Submit the dissemination plan—omitted in fiscal 2000
- Send the report on priorities for future research

**ADMINISTRATIVE**

**IDENTIFICATION AND APPROVAL OF PANEL MEMBERS**

- Identify and obtain approval on members to serve on the advisory and peer-review panels
- Submit the signed conflict of interest forms from each of the eight to ten individuals who agreed to volunteer as either a advisory or peer-review panel member for the topic

**QUARTERLY REPORTS**

Send a quarterly progress report that includes a financial statement in developing the evidence report—a mean number of eight quarterly reports per task order contract

**NO-COST EXTENSIONS**

Submit and receive approval on a no-cost extension prior to exceeding the task order contract deadline—a mean of one per topic

**POSSIBLE ARTICLE PUBLICATIONS**

Request and obtain approval prior to publishing the findings of the evidence report in a journal—a mean of one per topic

(Sources: Background Information, 2006; EPC J, Schedules of Work, 1997; Interview Statements, 2005.)

## Table 43:

## Effectiveness by Catalytic Control Used by EPC Program I:

## Consistent and Inconsistent Findings

| | | ***Effectiveness*** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **TRANSLATION** | | **DISSEMINATION** | | **ACCESSIBILITY** | | **RELATIONSHIP** | | |
| ***EPC Program I's Use of Catalytic Control*** | PROGRAM I | Translations | Time | Links | Immediate | 6 Months After Publication | 12 Months After Publication | **Consistent** | **Inconsistent** | **TOTAL** |
| | | *n* | *n* | *n* | *n* | *n* | *n* | *n* | *n* | *n* |
| Drafted *EPC* schedules of work | Partners | Inconsistent | Consistent | Consistent | Inconsistent | Inconsistent | Inconsistent | 2 | 4 | 6 |
| | EPCs | Consistent | Consistent | Consistent | Inconsistent | Inconsistent | Inconsistent | 3 | 3 | 6 |
| | Total | Consistent | Consistent | Consistent | Inconsistent | Inconsistent | Inconsistent | 3 | 3 | 6 |
| Required *partner* correspondence | Partners | Inconsistent | Consistent | Consistent | Inconsistent | Inconsistent | Inconsistent | 2 | 4 | 6 |
| | EPCs | Consistent | Consistent | Consistent | Inconsistent | Inconsistent | Inconsistent | 3 | 3 | 6 |
| | Total | Consistent | Consistent | Consistent | Inconsistent | Inconsistent | Inconsistent | 3 | 3 | 6 |
| *Consistent* | | 4 | 0 | 6 | 0 | 0 | 0 | 16 | - | 16 |
| *Inconsistent* | | 2 | 6 | 0 | 6 | 6 | 6 | - | 20 | 20 |
| **TOTAL** | | 6 | 6 | 6 | 6 | 6 | 6 | 16 | 20 | 36 |