

# **Literature Review: Analyzing Implementation and Systems Change—Implications for Evaluating HPOG**

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**Implementation, Systems and Outcome Evaluation of the Health Profession Opportunity Grants (HPOG) to Serve TANF Recipients and Other Low-income Individuals**



# Literature Review: Analyzing Implementation and Systems Change—Implications for Evaluating HPOG

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## Overview

The Health Profession Opportunity Grants (HPOG) Program was established by the Affordable Care Act of 2010 (ACA) to provide training in high-demand health care professions to Temporary Assistance for Needy Families (TANF) recipients and other low-income individuals. The Administration for Children and Families (ACF) of the U.S. Department of Health and Human Services is utilizing a multi-pronged evaluation strategy to assess the program implementation, systems change, outcomes and impact of these HPOG demonstration projects. Specifically, the HPOG National Implementation Evaluation (HPOG NIE) and the HPOG Impact Study, which both use rigorous implementation analysis methods, will inform ACF and the field about the most effective design and implementation strategies for achieving successful training and employment outcomes for these populations. The focus of this paper is a review of the research literature on implementation analysis and implications for the HPOG evaluations.

The earliest generation of implementation studies focuses on *conceptualizing and understanding* the complexities involved in transforming policy into program operations at the local level. A second generation of studies focuses on *refining frameworks and applying* them to different program areas. These studies introduced more structured variable definitions and data collection methods and, sometimes, quantitative analysis, often in the context of impact evaluations, program performance analysis, and/or analysis of community and systems change. Recently, what might be called third generation studies use a combination of qualitative and quantitative approaches to *analyze systematically implementation, program operations, service delivery, and links* between program implementation factors and individual-level outcomes and/or program performance.

Several key points relevant to evaluating HPOG emerge from the literature. For example, it is important to recognize that programs are at different stages of implementation when collecting data and interpreting the results. It is also important to note that, because systems change and implementation research are not entirely separable domains, the HPOG NIE analysis must consider programmatic, institutional, and sectoral levels to measure systems change using implementation analysis methods.

The implementation literature also reveals that a mix of quantitative data collection and analysis and more traditional qualitative approaches is desirable to capture different perspectives about implementation and systems change, create standard variables that can be included in outcomes modeling, and consider the generalizability of findings for programs that might operate elsewhere. At the level at which services are delivered (e.g., classrooms, case management units), there are implementation science data collection and analytic methods that could produce standardized measures of program services and strategies.

As the literature suggests, the HPOG NIE can use implementation analysis to assess systems change (especially at the grantee, site, service provider and participating firm levels), document the implementation of HPOG programs, define the context within which each of the HPOG grantees and its sites are operating, and assess the quality of implementation or fidelity of selected models or strategies. The HPOG evaluation also provides the opportunity to advance the level of implementation analysis rigor. Integrating the implementation research and implementation science approaches in the HPOG NIE design and across the HPOG research portfolio is a particularly promising approach to better understanding the interaction of service components, service delivery strategies, outcomes and impacts of HPOG programs.

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The Health Profession Opportunity Grants (HPOG) Program was established by the Affordable Care Act of 2010 (ACA) to provide training programs in high-demand healthcare professions to Temporary Assistance for Needy Families (TANF) recipients and other low-income individuals. Beginning in 2010, the Administration for Children and Families (ACF) of the U.S. Department of Health and Human Services (HHS) provided five-year grants to 32 grantees in 23 states across the United States. HPOG grantees include post-secondary educational institutions, workforce investment boards (WIBs), state or local government agencies, and non-profit organizations (NPOs). Five grantees are Tribal organizations.

ACF is utilizing a multi-pronged evaluation strategy to assess the HPOG demonstration projects. This strategy includes the following components: (1) the HPOG Implementation, Systems and Outcome Project; (2) Evaluation of Tribal HPOG; (3) HPOG Impact Study; (4) additional impact studies of a subset of HPOG grantees through the Innovative Strategies for Increasing Self-Sufficiency (ISIS) project; (5) HPOG National Implementation Evaluation; and (6) University Partnership Research Grants for HPOG. These research and evaluation activities aim to provide information on program implementation, systems change, outcomes and impact.

One of the core HPOG studies—the HPOG National Implementation Evaluation (HPOG NIE)—includes integrated study components examining program design and implementation, systems change and participant outcomes. Another core component—the HPOG Impact Study—includes a design that goes beyond outcomes measurement to estimate program impacts, or the degree to which the program improves participant outcomes. Addressing the research and evaluation questions set forth for the overall HPOG research portfolio requires a rigorous implementation and systems change analysis and outcomes measurement. The HPOG NIE provides an important opportunity to apply theoretical frameworks and innovative measurement approaches for implementation analysis and consider appropriate ways to incorporate implementation factors into program evaluation that will have implications beyond HPOG. In particular, by integrating the HPOG NIE findings about program design, implementation and outcomes into the HPOG Impact Study, the overall evaluation design for HPOG holds the promise of assessing components of program design and implementation *as causal factors* in producing program impacts.

This paper provides a review of formal research reports and published literature on implementation analysis. It begins by defining implementation analysis and summarizing methodological issues and topics addressed in this type of analysis, including a brief review of some of the recent advances in analysis methods. Next, we present systems change analysis, an approach often included in implementation analysis and one which may be employed to understand how HPOG might affect the broader health care training system and employment practices. Finally, we summarize implications of this review for the HPOG NIE design.

## What Is Implementation Analysis?

The study of implementation analysis emerged and grew as a social science field of inquiry in the period after the War on Poverty. By that time, implementation studies were already being used in some policy areas, mainly foreign policy (Allison, 1971, p. 338), and they provided conceptual frameworks that could be adapted to social policy to better understand how antipoverty programs worked and explore explanations for variations in program effectiveness. One of the earliest social policy implementation studies examined a federally funded economic development program in

Oakland, California (Pressman and Wildavsky, 1973). That study helped to refine concepts of implementation and to distinguish among the different stages of policy implementation: beginning with policy formulation and legislative development and moving to program operations and service delivery. Hargrove (1975) and others believed that understanding implementation was “the missing link” or “black box” in policy analysis and program evaluation. Subsequently, there have been literally hundreds of books, articles, and research reports on conceptual frameworks of policy and program implementation, methods for conducting implementation analysis, and studies of implementation.

Implementation analysis is now very common, and yet there is no single definition or common methodology, in part because studies draw from different academic disciplines (Holcomb and Nightingale, 2003; Devers, 1999; Kaplan and Corbett, 2003; Werner 2004). For example, implementation analysis is sometimes referred to as a branch or type of program evaluation; but it also is referred to as implementation research, implementation evaluation, process analysis, management research, organizational analysis, or case study research. Corbett and Lennon (2003, p. 1), for example, broadly define implementation analysis as “evaluative strategies that, in effect, explore the translation of plausible concepts into functioning policies and programs.” Others define implementation analysis more programmatically, to examine how well or efficiently a program is implemented, whether a program was implemented as intended and how, and why a program may have changed over time (Rossi, Freeman, and Lipsey, 2004). One simple definition of program-focused implementation analysis is offered by Patton (2008): an “evaluation that focuses on finding out if a program has all its parts, if the parts are functional, and if the program is operating as it’s supposed to be operating.” Regardless of terminology, since the 1970s, implementation analysis approaches have evolved from mainly qualitative descriptive studies of a single program to multi-site, multi-method interdisciplinary studies addressing every aspect of program and system design, operations, performance and effectiveness.

DeLeon (1999) offers a useful synthesis of how this cross-disciplinary and non-standardized field of study evolved (Exhibit 1). The earliest generation of implementation studies focuses on *conceptualizing and understanding* the complexities involved in program implementation, particularly intergovernmental programs and how they were carried out at the local level. A second generation of studies focuses on *refining frameworks and applying* them to different program areas. These studies introduce more structured variable definitions and data collection methods and, sometimes, quantitative analysis, often in the context of program evaluations, program performance analysis, and/or analysis of community and systems change. Recently, what might be called third generation studies use a combination of qualitative and quantitative approaches to more *systematically analyze implementation, program operations, service delivery, and links* between program implementation factors and individual-level outcomes and/or program performance. Statistical modeling is also used to analyze how evidence-based program models are systematically institutionalized, adopted, and scaled (Fixsen et al., 2009; Bloom, Hill, and Riccio, 2003; Weaver, 2010; Durlak and DuPree, 2008). Currently, a body of implementation science literature has emerged from education, criminal justice, and social services program studies that systematically analyze the adoption of practices and models that have been proven to be effective (Fixsen et al., 2005).

**Exhibit 1. Evolving Sophistication of Implementation Studies**

Phase	Examples of Issues of Interest	Examples of Key Literature/Studies
<b>First Generation Implementation Studies:</b> Conceptual frameworks, descriptive and analytic case studies	<ul style="list-style-type: none"> <li>• Understand problems and challenges that hinder policy implementation</li> <li>• Assess implementation processes (e.g., top-down and bottom-up case studies; street-level bureaucracy; understanding intergovernmental activities and interprogram partnerships)</li> </ul>	<ul style="list-style-type: none"> <li>• Allison</li> <li>• Pressman and Wildavsky</li> <li>• Derthick</li> <li>• Hargrove</li> <li>• Lipsey</li> <li>• Van Horn and Van Meter</li> </ul>
<b>Second Generation Implementation Studies:</b> Development and refinement of models, hypotheses and variables involving implementation; and building theory	<ul style="list-style-type: none"> <li>• Analyze program, community, and other contextual factors related to variations in implementation; apply theories of change; network analysis</li> <li>• Document and measure service delivery procedures and models (e.g., measures of line staff work activities and procedures; identification of “best practices”)</li> <li>• Help explain impact evaluation findings</li> <li>• Understand dimensions of systems change at the organizational and community/neighborhood level</li> <li>• Examine relationships between implementation and program performance</li> </ul>	<ul style="list-style-type: none"> <li>• Bardach</li> <li>• Welfare to-Work demos</li> <li>• Comprehensive community initiatives; saturation studies</li> <li>• Brodtkin</li> <li>• WIN, ES, JTPA Performance (Mead, Mitchell et al., Ferry and Nightingale)</li> <li>• Connell et al. (CCI)</li> <li>• Werner</li> </ul>
<b>Third Generation Implementation Studies:</b> Applications of increasingly analytic and rigorous empirical methodologies, and systematic studies to expand evidence-based practice	<ul style="list-style-type: none"> <li>• Analyze implementation, organizational and other factors related to program performance (e.g., multi-level hierarchical analysis of inputs, implementation, and outcomes)</li> <li>• Analyze implementation and program factors associated with program impacts/outcomes; multi-site and cross-site analysis</li> <li>• Analyze process of adoption of proven program strategies and models (e.g., replication, fidelity), and factors associated with successful adoption</li> </ul>	<ul style="list-style-type: none"> <li>• Multilevel hierarchical modeling (Lynn, Heinrich, Hill)</li> <li>• Greenberg et al., Ratcliffe et al.</li> <li>• Van Horn, Meyers</li> <li>• Sowa, Seldon, and Sanford</li> <li>• Bloom et al.</li> <li>• Implementation Science</li> </ul>

Source: Adapted from and expanding upon deLeon (1999).

Over time, implementation factors were systematically included in evaluations of the effects social programs have on individual participants (Kaplan and Corbett, 2003). The first evaluations that included implementation analysis components were in the areas of clinical medicine and education, followed by studies of welfare, employment and training, social services, and youth development, and then community and economic development and criminal justice. As implementation analysis became a common component of large-scale impact evaluations, analysts began also to address concerns about inherent limitations of qualitative analysis by combining qualitative and quantitative data to describe more precisely program implementation and to relate implementation to program outputs, outcomes and impacts. For example, Goggin et al. (1990) suggest designs with “clearly testable

hypotheses” that allow implementation analysis not only to offer descriptive insight into programs, but also to help interpret and refine the statistical impact analysis results.

The latest generation of implementation analysts have contributed to the field by promoting approaches referred to as implementation science. The term alone represents a major advance, raising the attention paid to theoretical and methodological rigor and promoting the use of common measures and data collection approaches. Implementation science in social policy (e.g., education, child care, child welfare) has been adapted from health and medical research that has analyzed how and why treatments, medicines, and approaches found effective are adopted by health practitioners. Implementation scientists have established some common language and methods across studies to address and assess a number of issues including implementation success, fidelity to a program model, inter-unit and inter-organizational interaction, staff professional development, worker and customer satisfaction, and institutional capacity (Fixsen et al., 2005).

Overall, implementation analysis has evolved out of multiple academic disciplines, each with its own unique terminology, favored theories, and range of research and evaluation questions. The next sections briefly summarize some of the conceptual, data, and analytic issues drawn from the literature that provide insight into designing an evaluation of HPOG implementation, systems change, and outcomes.

## **Design and Methodological Issues in Implementation Analysis**

The research literature includes hundreds of implementation analysis studies of human services and employment and training programs. This section provides a brief review of some of the designs and methodological issues in implementation analysis that may have applicability to the HPOG evaluation. It is not an exhaustive review of studies or findings, but highlights a few points that are particularly relevant to the HPOG evaluation: 1) conceptual models are routinely used in evaluations and implementation studies; 2) understanding the stages of implementation is very important; 3) traditional field-based data collection and qualitative analysis are the norm; but 4) both quantitative analysis and a mix of qualitative and quantitative analyses are increasingly used to examine and understand program performance, participant outcomes, and implementation success; and 5) implementation science methods are especially promising.

## **Conceptual Frameworks**

Conceptual frameworks are common in implementation studies. Various models are used, reflecting theories from many disciplines, including political science, public administration, sociology, social psychology, organization theory, and economics. Frameworks are usually presented graphically and referred to as logic models, theoretical models, or conceptual models. While the details vary, the structure of the models is similar, including: (1) categories of variables that define the context in which the program or policy of interest operates and (2) hypotheses about the interactions among the variable categories. Frameworks help structure the categories of data that will be needed to address the questions of interest and the types of qualitative and quantitative analysis that will be done (Fixsen et al., 2005; Greenhalgh et al., 2004; Proctor et al., 2009; Stith et al., 2006; Wandersman et al., 2008; Prochaska et al., 2009; Panzano, Seffrin, and Chaney-Jones, 2005; McCormick, Steckler, and McLeroy, 1995). Adhering to clear frameworks also helps minimize perhaps the greatest pitfall

of implementation studies: the risk of collecting too much extraneous (although often interesting) data (Holcomb and Nightingale, 2007; Werner, 2004).

In the human services domain, implementation studies are often differentiated by whether they use a “top down” or “bottom up” conceptual framework,<sup>1</sup> although many analysts today attempt to address issues from both perspectives. There has been strong interest in how government policies, law, and regulations can affect program operations and how resulting government performance can be measured. This focus on effective governance brought to prominence a “top down” approach to implementation analysis, and a desire to advance shared definitions and frameworks for analyzing public policies and programs. Many contend that analyzing core standard variables across multiple studies can, over time, create a theory of implementation that spans all types of policies and programs and that the findings from those studies can help identify ways to improve performance (Mazmanian and Sabatier, 1983; deLeon, 1999).

Others used a “bottom-up” micro-level approach to measure and analyze systematically the detailed activities that occur at the local or micro-organizational level: community, service delivery, or office level. Lipsky (1980), for example, analyzed the operational translation of intended program goals to activities by “street-level” bureaucrats within complex local environments. Elmore (1982) developed a technique called “backward mapping” to trace the process of implementation from the program’s final service recipient back to the policy makers and the program’s original intent. At the same time that the study of implementation was developing in public policy, organizational scientists, management analysts and industrial relations researchers were perfecting methods for systematically measuring work unit characteristics, work responsibilities, organizational performance and productivity. Some of those approaches were also incorporated into social science implementation analysis (Ring and Van de Ven, 1992, 1994; Van de Ven and Poole, 1995).

One word of caution about conceptual frameworks is in order. Especially over the past decade with the proliferation of implementation science studies, one is easily overwhelmed by the number and types of different graphical models, which sometimes overshadow the research questions at hand and the analysis done. Developing and using logic models and conceptual frameworks should facilitate the evaluation and analysis, not be the central focus of a report.<sup>2</sup>

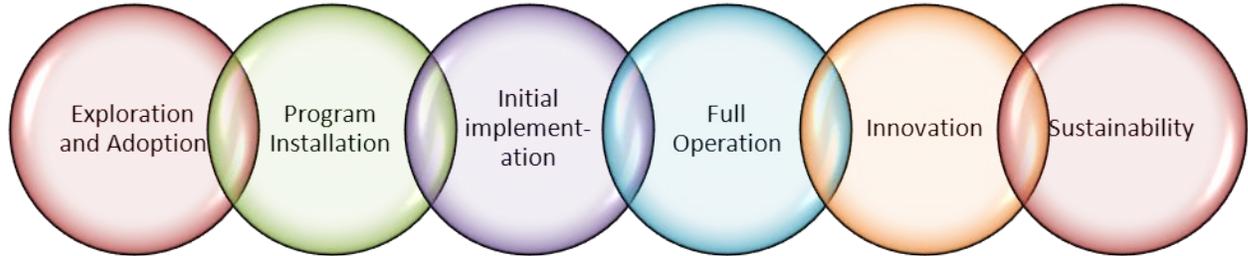
## Stages of Implementation

Nearly every implementation study directly or indirectly addresses the stages of implementation, for example, documenting the start-up of a program, or describing program operations in an ongoing program. While the phases of programs are described in various ways, Fixsen et al. (2005) offer a clear and concise conception of six stages of implementation (Exhibit 2).

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<sup>1</sup> By “top down” we mean the theory that implementation is the systematic translation of executive dictates down through the “chain of command” in the implementing organization or institution. By “bottom up” we mean the theory that implementation is what happens at the point of interaction between the implementing organization or institution and its stakeholders or constituency.

<sup>2</sup> This point was made by Robert Granger at a national foundation-sponsored conference on comprehensive community change research (Annie E. Casey Foundation, 1997).

**Exhibit 2. Stages of Implementation**

Source: Adapted from Fixsen et al. (2005).

The stage of implementation is sometimes a key analytic focus. Several studies, for instance, specifically analyze the early (“start-up”) stages: exploration (e.g., Rogers, 2003) and initial implementation (e.g., Leschied and Cunningham, 2002; Washington State Institute for Public Policy, 2002). Analysis of outcomes and performance should ideally be done when a program or model is fully operational, that is, at the point where the interventions and the systems supporting them are well developed and have a chance to be fully implemented. (Gilliam et al., 2000; Liberman and Gaes, 2011).

Knowing when a program has reached the stage where it is ready to adopt innovations is of interest, in part because of the priority placed on replicating best practices. For example, in one study, school districts were randomly assigned to experimental or control conditions to test new instructional approaches (McCormick et al., 1995). All districts were provided with a choice of middle school tobacco prevention curricula. Health education teachers and administrators in the experimental school districts also received in-depth training on the curriculum. Researchers found that smaller school districts (smaller numbers of teachers, less bureaucratic administrations) were more likely to decide to adopt a curriculum at the conclusion of the exploration stage. A positive organizational climate (job satisfaction, perceived risk taking, managing conflict, involvement in decision making) was also associated with both the adoption decision and with implementing the curriculum as designed.

Studies in other program areas have developed measures of the feasibility or “readiness” of implementation in, for example, foster care services (Chamberlain et al., 2008), juvenile delinquency prevention strategies (Fagan et al., 2008), and substance abuse treatment (Saldana et al., 2007; Simpson and Flynn, 2007). Finally, implementation analysis is also commonly used to assess the extent to which a program is “evaluative” and reached steady-state program implementation by determining, for example, whether a particular program or strategy is actually operating, has clear goals and objectives, and maintains accurate data needed for evaluation.

### **Traditional Field-Based Implementation Methods**

Since the 1970s, traditional implementation studies of human services and related programs have been mainly qualitative in nature and have used field-based data collection to document key features of program implementation, such as organizational structure, procedures, staff responsibilities, service delivery structure, client flow, management functions, and interagency interaction and coordination. The common data collection methods used include interviews with program management and line staff, staff-completed questionnaires, observations of program activities, document reviews, and focus groups with program participants (Campbell and Russo, 2001; Shadish,

Cook, and Campbell, 2002, pp. 318–319; Werner, 2004). Ethnographic studies sometimes complement more structured implementation data collection, providing a richer understanding of the nuances of different perspectives on implementation phenomena (Yin, 1982). The case studies, implementation reports, and program profiles resulting from this approach provide a rich description of program implementation and operations, often grounded in the theoretical principles of one or more academic discipline. The highlighted text below provides some examples of traditional field-based implementation study approaches, case studies and field network research.

### **Types of Field-Based Traditional Implementation Studies**

**Case studies** typically describe in detail one or a few programs (e.g., welfare, job training, child care, child welfare), or the system in one or a few sites (e.g., community or economic development, social services). Some case studies are exploratory or illustrative, but others seek to establish cause and effect relationships. Case studies are typically labor and resource intensive, use the same interview or observational protocols in each site, and are based on a common framework (Yin, 1982).

**Field network research** uses experienced researchers who are specifically trained to systematically document program context and operations. Researchers consolidate and synthesize key implementation patterns across multiple sites, particularly focusing on perceived effectiveness, cross-program interactions, systems change, and challenges to implementation (Cook and Payne, 2002; Williams et al., 1982). The approach has been common in employment and training, welfare, social services, and other programs, including some recent assessments of the American Recovery and Reinvestment Act (ARRA).

**Process analysis** is the systematic development of descriptions of service delivery flow (or client flow) in a program, and of key components or services within the service delivery system. Process analysis is routinely included in rigorous evaluations of individual impacts of programs and demonstrations in welfare, employment, and social services. At a minimum, the process descriptions are qualitative, usually accompanied by logic models that describe hypothesized relationships between components and outcomes, and/or client flow and management flow charts that document and track program operations, activities, and results. More sophisticated process analyses also include staff surveys to better measure organizational, work unit, and interorganizational factors (Cox, Humphrey, and Klerman, 2001; Hendra et al., 2011; Scrivener and Walter, 2001).

### **Quantitative and Mixed Method Analysis**

As implementation methodologies have developed, quantitative analyses were added as a complement to qualitative analysis to examine specific issues, such as the relationship between program implementation and program performance or outcomes or the extent of policy diffusion in the adoption of innovative strategies (Kaplan and Corbett, 2003).

The simplest type of quantitative implementation analysis involves categorizing qualitative information and creating quantifiable variables that describe various dimensions of implementation such as staffing, organizational features, management style, staff characteristics, program objectives and priorities, interorganizational partnerships, or service delivery models. The quantified measures can then be used in various descriptive tables such as summarizing participants by services received or developing program typologies (Fraker et al., 2007).

Across many policy areas, more sophisticated quantitative analyses of implementation attempt to explore the relationship between programmatic factors (e.g., services, components, management functions, organizational and interorganizational structure) and program performance or outcomes. For example, one recent large multi-site non-experimental evaluation of drug courts used formal qualitative field-based implementation analysis and surveys to collect standard program, community, and policy variables that were incorporated into an outcomes analysis. Hierarchical linear modeling was then used to associate variations in outcomes with variations across sites in court policies, adherence to key components of the drug court model, and other implementation factors unique to the criminal justice system (Rossman et al., 2011). In other policy areas, similar mixed method approaches are being used more often. In the employment and training area, for example, a number of quantitative or mixed method implementation studies have been done examining the relationships among implementation factors, program performance, and participant outcomes.

This literature suggests three issues that should be considered in designing strong evaluations of employment programs.

- ***Economic conditions should be taken into account.*** Not surprisingly, labor market and economic conditions figure importantly in the success of employment-related programs and should be taken into account (in addition to participant characteristics and the services they receive). About half of the variation in program-level performance across local programs on measures such as entered employment rates, average starting wages of participants who enter jobs, and job retention may be due to socioeconomic characteristics of the local area such as unemployment rate, mix of industries and occupations in the labor market, poverty rate, and female labor force participation rate (Chadwin, Mitchell, and Nightingale, 1981; Ratcliffe, Nightingale, and Sharkey, 2007).
- ***Organizational and programmatic factors influence program performance and participant outcomes.*** Organizational and programmatic features help explain participant outcomes as well as program performance. For example, one study involved a comprehensive meta-analysis of implementation factors and participant outcomes and included data from experimental evaluations of welfare-to-work programs involving over 50,000 individuals. This study identified strong employment and earnings impacts for participants in programs that placed priority on employment, provided clients with relatively personalized services, and had lower client/staff caseloads (Bloom, Hill, and Riccio, 2003).
- ***Multiple activities and a mix of services are common.*** Individuals in employment and training programs often participate in multiple activities either concurrently or consecutively. These participation patterns increase the need to consider service mix in designing statistical analysis. One non-experimental analysis of over 17,000 welfare recipients in the Massachusetts Employment and Training (ET) Choices program found that over 40 percent participated in multiple components; over 100 different combinations of services were identified. Impacts of seven different components were estimated by controlling for participation in other program components, demographic characteristics, the local program that provided the services, and local economic conditions (Nightingale et al., 1990).

## Implementation Science

As indicated in the previous section, implementation science has introduced important advances in systematically addressing some general issues that arise in implementation analysis (Durlak and DuPre, 2008). These include:

- Developing standard definitions and measures of programmatic components and activities
- Determining the point at which implementation reaches steady state
- Examining the extent to which evidence-based practices are adopted and the degree of fidelity to the original model
- Analyzing quality of implementation
- Determining “readiness” for adopting innovations
- Measuring service intensity and dosage
- Linking programmatic variables to individual outcome variables

Implementation fidelity has received considerable attention in the implementation science literature. This research addresses the extent to which critical components of a program are present when a model or innovation is implemented and the degree to which services and program activities align with the intended model. For example, a number of studies have focused on developing professional and organizational implementation fidelity of the “Communities that Care” model, a community-based youth risk prevention strategy. In this project, researchers have developed multiple approaches or frameworks for assessing fidelity, and applications of statistical analysis to help refine the measurements by, for example, analyzing non-linear relationships among implementation variables and considering how to create appropriate measures (Fagan et al., 2008).

Implementation science has also advanced the state of the art for analyzing how programs adopt innovations. Because there is generally uneven integration and diffusion of proven practices across social policies and programs, broader adoption of effective strategies could have substantial positive effects on participant outcomes (Hussey et al., 2003; McGlynn et al., 2003; Seddon et al., 2001; Liberman and Gaes, 2011). Prior research and theory about diffusion of technology or innovation in general are a source of useful if non-definitive insight about how change happens across entire sectors. As Berwick has written, “[t]he problem of dissemination of change applies not only to formally studied bioscientific innovations, but also to the numerous effective process innovations that arise from improvement projects in local settings, pilot sites, and progressive organizations. In health care, invention is hard, but dissemination is even harder” (Berwick, 2003, p. 1970).

Some analysts conceptualize how change, particularly technological, progresses from early adopters to laggards (Rogers, 2003) or from tigers to tortoises (Skinner and Staiger, 2009). In the social and economic areas, research has focused on the influence of social networks and other factors that facilitate or inhibit the spread of innovation from source to adopters. Still, the speed of the spread remains a key issue for studies of adoption of new technologies (Hall and Jones, 1999; Keller, 2004). There are different typologies of influence on this progression including: 1) characteristics of innovations and how they are perceived by potential adopters, 2) characteristics of adopters such as size, scope, organization, and 3) environmental or contextual influences.

One challenge to replicating innovative practices arises from miscommunication and lack of generalizability because studies use different definitions of program components, features and variables. To begin to resolve this problem, Fixsen et al. (2005) reviewed 377 articles that cut across disciplines (mental health, education, justice, child welfare) and found some common categories of variables used in research on programs:

- Detailed descriptions of the content or elements of the intervention (service system, delivery methods, or techniques)
- Characteristics of staff delivering the intervention
- Characteristics of program recipients or participants
- Characteristics of the program setting (e.g., “worksite,” office, classroom)
- The mode of delivery of the services (e.g., in person face-to-face, group versus individual)
- Service intensity (e.g., contact time) and duration (e.g., number sessions over a given period)
- Adherence to delivery protocols or to the model

In addition to standardizing definitions, implementation science research is identifying correlations between professional and organizational behavior and other contextual factors that influence participant outcomes. These findings can potentially help refine conceptual models and also provide useful operational insight into effective implementation or best practices. For example, a number of researchers have identified implementation factors across program interventions and evaluations that demonstrate evidence of implementation effects on participant outcomes (Fixsen, Blasé, and Naoom, 2010; Fixsen, Panzano, and Naoom, 2010; Durlak and DuPre, 2008). One meta-analysis (Durlak and DuPre, 2008, pp. 337–338) identified five major categories (and many subcategories) of implementation factors related to participant effectiveness in mental health prevention programs, which could also be applicable in other programs:

- Community-level factors (e.g., socioeconomic conditions)
- Provider characteristics (e.g., host institution mission and resources, physical location)
  - Extent to which the proposed innovation is relevant to local needs
  - Extent to which the innovation will achieve benefits desired at the local level
  - Self-efficacy
  - Extent to which providers feel they are able to do what is expected
- Characteristics of the innovation (e.g., the “model” and service delivery)
- Factors relevant to the prevention delivery system (e.g., organizational capacity)
- Factors related to the prevention support system (e.g., partner capacity and access to services)

Some implementation science researchers also focus on understanding how research can be more relevant to practitioners, or how to “move science to service.” To that end, analysts incorporate into their studies variables that specifically document and delineate the interactions between services and components that are associated with positive results (program performance or participant outcomes) (Mihalic et al., 2004). One review of implementation science studies determined that two frameworks

in particular can link research and practice to move from science to service more effectively (Fixsen et al., 2009):

- ***The stages of implementation framework*** views implementation as a process that requires an extended timeframe. It is a recursive process with steps that are focused on achieving benefits for individual consumers, organizations, and communities. It identifies six functional stages of implementation: exploration, installation, initial implementation, full implementation, innovation, and sustainability. The stages are not linear but interconnected.
- ***The core components of implementation framework*** establishes a core group of commonalities among successfully implemented programs from several fields. The goal of implementation is to have practitioners engage in a defined set of high-fidelity behaviors facilitated by core components of: staff selection, pre-service and in-service training, ongoing coaching and consultation, staff performance evaluation, decision support data systems, facilitative administrative supports, and system interventions.

In sum, both traditional implementation analysis and the more recent implementation science studies provide important insights into improving the conceptual frameworks and analytic methods used for evaluating programs. The next section discusses systems change analysis and its relationship to implementation analysis.

## Systems Change Analysis

In the hard sciences, systems analysis focuses on measuring, testing, and assessing change. For example, in biological, engineering, and computer/software systems, researchers specify the interactions among components associated with proper functioning of the relevant system. In the social sciences, systems change analysis focuses on understanding and assessing changes over time and interactions among organizational, programmatic and environmental components. Methods and measurements are less technical and less consistently defined than in the hard sciences. One of the challenges in assessing systems change is that analysts and practitioners may call their craft by different names, including “science of improvement,” “translational research,” “science of behavior change,” and “implementation science” (e.g., Titler, 2004; Madon et al., 2007; Clancy, Anderson, and White, 2009). Systems change analysis is useful for a range of purposes including, for example, program planning, budgeting, analysis, and evaluation. Included in the general rubric of systems change analysis are organizational studies examining the effect public policies have on organizations, institutions, businesses and industries in the labor market.

Often studies of systems change use implementation analysis methods to examine the degree of change, adoption of innovations, improved inter-organizational interaction, attitudinal or cultural shifts, institutionalization or sustainability of reforms, performance improvement, and other results expected from actions intended to facilitate change. Implementation itself is premised on change in the execution of a plan or the application of rules and regulations. Systemic studies of programs, organizations, inter-organizational networks, communities, or industrial sectors generally follow standard implementation analysis approaches. These studies draw from specific theories of change and conceptual frameworks, accompanied by logic models or other graphical representations that specify the hypothesized changes that are likely to occur in response to particular policy actions.

Examining systems change in the social sphere is complicated by three issues. First, to measure accurately the extent of change requires that a program develop over an extended period, as measuring change too soon may lead to erroneous findings. Second, many factors, observable and unobservable, may simultaneously be influencing observed changes; trying to attribute change to any particular factors may mask interaction effects. Third, and particularly important for HPOG, small or temporary interventions in a large multi-dimensional system (like the health care industry) may produce some changes in local systems that are not likely to be detected at the regional or national level. Systems change occurring at the institutional and sectoral levels is most relevant for the design of the HPOG National Implementation Evaluation.

## Institutional Change

One useful way to consider systems change at the institutional level is offered by Zammuto's (1982) concepts about organization evolution. He distinguishes among systems change, system adaptation and performance improvement. He also incorporates contingent dimensions of organizations and staff. That is, perspectives about the extent of change and the performance of an organization vary depending on an individual's role in relation to the organization (e.g., constituent, client, funder, collaborator, customer, manager, or line staff). Measures that can help describe and track aspects of change that are contingent upon organization operations include satisfaction of partners, customers, and workers; community perceptions about organizational legitimacy; and consistency of the language used to explain institutional priorities or mission.

Several studies of job training and community colleges have addressed systems change using factors similar to those suggested by Zammuto. In a study of the Department of Labor's Community-Based Job Training Grants, an initiative providing grants to organizational partnerships to offer training in high-demand occupations, researchers used field-based site visits and grantee surveys to examine several dimensions of institutional change (Eyster, 2012):

- **Capacity development** such as development of new curricula and instructional materials; adoptions of innovative services, strategies, or curricula; increased number of occupational training courses/programs offered; increased number of instructors/faculty; new/additional staff development offered; development of new public labor market information about high-growth occupations; adoption of new evidence-based models; increased pipeline of trainees for high-growth occupations; improved or expanded partnerships.
- **Priority/awareness** including increased institutional priority on workforce training; increased staff/instructor knowledge about career ladders; increased goal consistency within the organization; increased external awareness about the program.
- **Performance** such as improved implementation; improved training quality; program performance improvement; increased or improved employer engagement; improved customer and user satisfaction.
- **Funding** as measured by increased operational budget; increased organizational resources devoted to occupational training; increased matching/leveraged funds.
- **Program sustainability**, for example, continued improvement or sustaining of capacity developed; continuous performance improvement; progress towards permanent funding.

Studies of systemic change in community colleges have focused more on broader factors, in part because the focus and mission of the institutions have changed substantially over the past three decades. Much of the change has been attributed to economic factors and fiscal stress as schools have struggled to survive and grow (Levin, 2001). More diverse sources of funding were identified to “survive and adapt,” aggressively seeking, for example, more government and foundation grants and customized training contracts, and maximizing student financial aid. In addition, community colleges’ goals have changed from their original mission of being mainly a transfer institution to multiple objectives. For example, many colleges have expanded their programming to be more responsive to employer needs and economic development goals of the community, develop dual enrollment programs for high school students to obtain college credit and credentials, and target adult learners who have low education levels. The shift has resulted from a combination of more student diversity, more sources of funding, and more program offerings. As a result, the extent of ongoing system-wide changes makes it extremely difficult to isolate the effects of any single new program.

Bragg (2001, 2009) explains that this shift from a focus on transfer students to a more comprehensive one has led to major institutional and cultural changes. Some continuing tensions persist between the traditional transfer goal and the current challenges of offering a range of occupational and developmental programs as well as academic courses. Not all community colleges are changing at the same pace or in the same manner, and changes are occurring so broadly that they “all blend together” because they are both comprehensive and systemic. In addition, some schools are more smoothly adopting and integrating the new missions, while in others there is clear organizational tension among goals that some administrators and faculty consider to be competing. Studies of the degree of goal consensus within community colleges confirm these tensions. Levin (1998) used staff, student, and faculty surveys to measure perceived mission agreement and organizational culture and compared those items to perceived performance, also measured with surveys and administrative data, to create items such as student and faculty satisfaction, student academic achievement, student career development and employment, organizational flexibility and adaptability, and institutional access to external funding. He found that mission consensus is positively associated with high perceived effectiveness (e.g., satisfaction), but not with institutional effectiveness (e.g., academic success, funding, flexibility). Bragg notes that there are two types of community college cultures—“transfer AND vocational” and “transfer OR vocational,” with schools in the latter category experiencing a type of organizational identity crisis. Other types of dichotomies, or continuums, across and even within community colleges include the relative balance between open admission versus entry requirements; credit versus non-credit courses; traditional versus non-traditional students; and campus courses versus off-campus and online course offerings.

Regardless of culture, though, it is clear that community colleges nationwide are undergoing major systemic changes and it is difficult to differentiate reasons for the changes that are occurring.

## **Sectoral Change**

Systems change can also be examined at the sectoral or industry level, which for the HPOG evaluation is the health care delivery system. In the U.S., health care is delivered and financed in a decentralized fashion, with numerous independent actors competing and sometimes collaborating to deliver or pay for different kinds of services. Similarly, the education and training entities that prepare individuals for employment sometimes coordinate with each other, but often not. Examining systemic change in this very large and decentralized health care system involves understanding how change

occurs in this sector, particularly in the adoption of new strategies, innovations, or practices. It requires understanding shifts or changes that may occur in one or more health care providers versus change in the sector as a whole.

A few key points emerge from a brief review of literature about changes in the health care sector. First, to affect an entire sector such as health care delivery (e.g., institutional or community long-term care, hospitals, health clinics), workforce training programs must prove their added value, reach their intended targets, and influence real-world behavior. Just as ineffective implementation may undercut a statute's intentions in practice (Pressman and Wildavsky, 1973), shortfalls in diffusion or dissemination of new educational and placement innovations may minimize or even undercut any impact the new strategies might have on health care systems. Second, caution needs to be exercised in drawing lessons from other sectors for health care because simple analogies oversimplify the context (Gawande, 2009). In health care, for example, adoption of money-saving or value-enhancing innovations can be very slow compared to other sectors. Third, health care is a field that is very sensitive to changes in policy at all levels, and there may be strong economic and advocacy interests on all sides of existing practices and potential changes. Fourth, most health-sector research on the spread of innovations focuses on technology or clinical practices that directly affect patients, not on the staffing of health care institutions or other changes in business practice within offices and institutions where clinical interactions occur.

Health care financing and delivery systems are characterized by several defining elements: information asymmetries between caregivers and patients; separation of decision making across parties; small scales of many offices, clinics, home health agencies, nursing homes, hospitals and other providers of services; dominance of third-party payment for services; the limited role of horizontally and vertically integrative structures; and the personal service nature of “production.”

These factors allow professional or managerial traditions to exert larger sway in decisions on how to produce care than appears to be typical elsewhere in the economy. Absent strong external motivators, simple inertia may exercise considerable influence on modes of organization, operation, and staffing. Substantial differences within the health “system” also exist across differently organized and financed sites of practice.

Systems changes in the health care sector may evolve from internal or external influences (Greenhalgh et al., 2004; Mitton et al., 2007; Nicolini et al., 2008). The Greenhalgh review of diffusion of innovations in service organizations is particularly thorough, both in its method of search and review and also in drawing together insights from many different disciplinary perspectives on change, from rural sociology to marketing and the movement for evidence-based medicine. This review finds three paradigms about the spread of innovation: diffusion (let it happen), dissemination (help it happen), and implementation (make it happen).

The first paradigm of innovation—diffusion—occurs naturally within a free market system. There, adoption and spread are sparked by the relative advantage of the innovation, compared with competing modalities already in use. Here the key factor for diffusion to happen is that the innovation must add value from the perspective of the adopter (Greenhalgh et al., 2004). Berwick reports that the “most powerful” factor in the spread of innovation is “the perceived benefit of the change” (Berwick, 2003, p. 1971). Still, natural forces can take many years or decades to spread even an obvious improvement throughout a sector. Social relationships, communication channels, and other factors play a role in addition to strictly economic considerations.

Under the second paradigm of innovation—dissemination—promoters of evidence-based medicine have sought to stimulate change, particularly, by actively and widely disseminating information to move clinical practice to “evidence-based” medicine (Eisenberg, 2001). For example, facilitating entities, such as the federal Agency for Healthcare Research and Quality (AHRQ) foster change by offering information, advice, encouragement, and technical support to the ultimate adopters of program innovations. Efforts to diffuse good information in clinical health care often start with systematic reviews of the most credible analyses of innovation and then translate those findings into practical recommendations for change. Promoters of operational or management changes often rely on case studies, expert consensus, and other methods for determining best practices (Denis et al. 2002; PHI, 2011; Perla, Bradbury, and Gunther-Murphy, 2011).

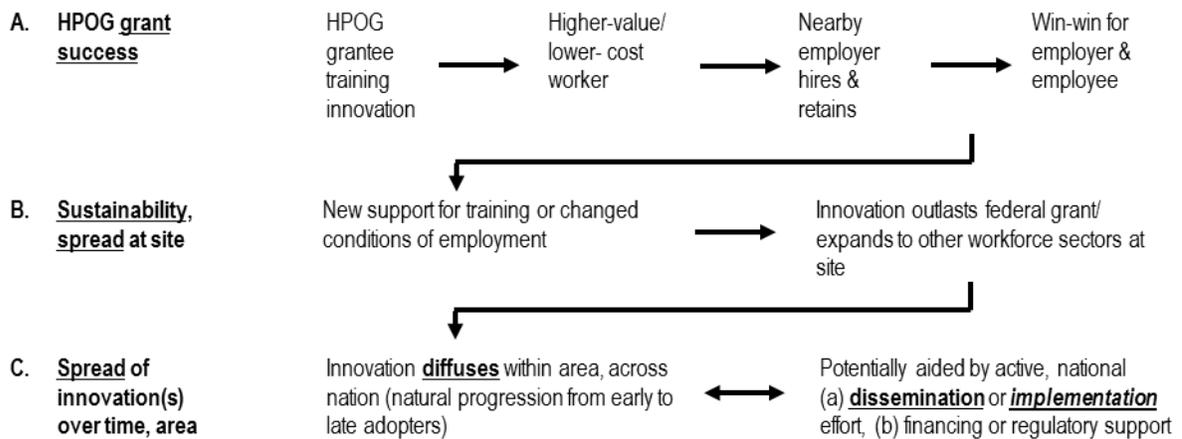
The third paradigm for understanding how innovation and change occur in the health care sector—implementation—assumes direct control over innovation within an institution. Implementation science emerged first in the health care policy area to study “methods to promote the uptake of research findings into routine healthcare in both clinical and policy contexts.”<sup>3</sup> Often the focus of study or advice is indeed how to facilitate implementation of change within large organizations. For example, sustainability is the last of the six stages of implementation identified by Fixsen et al. (2005). Greenhalgh et al. (2004) note that sustainability is the point at which use of an innovation becomes “routine.” A good current example of active implementation is the very large federal effort to implement health information technology (HIT)—and its “meaningful use”—throughout health services and financing.

Systems change is initiated at the health care services provider level in response to supply and demand factors. In this sector, changes related to the sector workforce are more complex than changes related to new medical procedures or devices. Due to the advantages and disadvantages of a system that includes multiple parties, success for a training program and for its graduates often depends upon complementary changes among employers that compose the demand side of the labor market. Exhibit 3 presents a simplified conceptualization of three levels of “system” in health care within which worker training programs operate: Level A is the training program (noted as HPOG), Level B is the employer, and Level C is the health sector system. In the case of the HPOG program, change begins at each local health care training program seeking to innovate, in partnership with training collaborators and the employers that hire most of its “graduates” (Level A). Level B represents the next stage of successful system effect, the program’s persistence over time, even without specific federal subsidy for its model of innovation, along with scaling up to applications in other training programs run by the initial grantee or by others. Finally, a very successful innovation might be adopted in even more markets (Level C). Figure 2 is consistent with the logic behind sectoral or systems strategies to training. Both the employment and training system and the systems of each relevant prospective local employer need to be included in any re-design of workforce development (GAO, 2008; Blair and Conway, 2011; deLeon, 1999).

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<sup>3</sup> The quotation is from the homepage of *Implementation Science*, <http://www.implementationscience.com>. See also Madon et al. (2007).

**Exhibit 3: Pathways from HPOG Innovation to Systems Impact**



Source: deLeon (1999).

An important aspect of how the interaction of demand and supply factors can, over time, change the entire system relates to the relatively high number of low-wage jobs in the health care sector. Such entry-level jobs traditionally offer low wages and little chance for advancement, so turnover is high, according to conventional wisdom and some data (GAO, 2001; Fraker et al., 2004; Rangarajan and Razafindrakoto, 2004; Schochet and Rangarajan, 2004; Andersson, Lane, and McEntarfer, 2004). Indeed, turnover rates average “nearly 70 percent annually in nursing homes and 40 to 60 percent in home care,” according to PHI PolicyWorks (2011). In turn, the quality of caregiving provided to the elderly and disabled populations suffers; direct care workers are by far the dominant source of their care.

If the workers who leave low-paying jobs obtain better positions, their training can be said to have succeeded, but not necessarily in health care as intended. One study in Florida found that only about half of newly certified nursing aides were still working in health care a year later (Harris-Kojetin et al., 2004). Lack of advancement in the initial placements seems likely to feed back into reduced incentives to obtain health care training among prospective workers. From the perspective of employers, such high turnover adds to labor costs and reduces the quality of caregiving that can be produced. This also hurts their ability to attract private patients, who pay better rates than do publically financed programs like Medicaid or Medicare. Different measures are needed to gauge the extent and success of systems change at each of the three levels reflecting the role the level plays in the entire health care system:

- For Level A, measures should reflect both the employer and worker perspectives. On the employer side, simple measures include the number of individuals trained, and their job placement and retention rates. One review (Conway, Blair, and Gerber, 2008) suggests more systemic measures that have meaning to employers based on a business value assessment such as return on investment indicators or reduced turnover, or monetizing less tangible benefits such as better fit of new trainee placements with job needs, better quality relationships with customers, or higher morale in the department affected.

To reflect worker perspectives, systems change measures might focus on career advancement, such as the extent to which businesses establish career ladders; or on public/private

collaboration, such as expanded business interaction with employment and training programs (Wolf-Powers and Nelson, 2010).

- At Level B, the relevant systems effect is the extent to which an innovation is sustained at the organization. This means continuing to operate the program at the end of the grant, perhaps adapting the same methods to other areas than the healthcare training included within the original grant, and funding the continuation through improved efficiencies or added value. One measure of systems effect at this level would be continued partnership with employers, especially through monetary contributions or in-kind support to the training activities not fundable from trainee tuition. If placements improve and grants or loans are available, trainees with better placement prospects may be able to contribute more than in the past.
- A Level C view of “the system” returns to the national perspective to measure the same concepts of diffusion, dissemination, and implementation noted earlier in terms of changes in the entire system, taking into account the context within which the change occurs, particularly the complex of interactions across different entities at different levels of the system.

## Implications for the HPOG Evaluation Design

The review in the previous sections suggest a number of issues that have been considered in developing the design for the implementation and systems change analysis components of the HPOG National Implementation Evaluation (HPOG NIE).<sup>4</sup> The following summarizes those issues and indicates how they have informed the HPOG NIE design:

- It is critical to recognize that programs are at different stages of implementation. The most obvious implication of this is that outcome or impact analysis of programs and services should ideally be done only when programs have reached “steady-state” maturity. Evaluability assessments typically determine whether the program is ready to be evaluated and implementation science research assesses the extent to which a program adheres to a particular model based on the current stage of implementation. Evaluability assessments are not always possible, and, as in HPOG, which is not a permanently funded program, it is not always possible to delay an evaluation until the program has reached full maturity. In any case, it is important to take into account the stage of implementation, for example building in multiple rounds of structured site visits. The HPOG NIE surveys are being fielded near the beginning of the fourth year of HPOG operations and so will likely capture information about mature programs. Moreover, changes over time in program design and service delivery are documented by grantees in bi-annual progress reports.
- “Top-down” and “bottom-up” approaches to documenting and assessing implementation each provide important information. Incorporating both elements in the evaluation design will produce a more complete assessment of implementation and systems change. In the analysis of more qualitative or grantee-specific issues (e.g., inter-organizational relationships, quality of implementation, employer interactions, model fidelity), it will be important to address

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<sup>4</sup> As of the date of this literature review (September 2013), the design report for HPOG NIE is under review by ACF. Note also that the findings of HPOG NIE will be used by the HPOG Impact Study in its estimation of the impacts of specific HPOG program components and features.

topics of interest from different perspectives and different levels of the system (e.g., line-service delivery/classroom, program, institution, employer, community/area). In keeping with this approach, the HPOG NIE will be examining the perspectives of grantee management and staff, program partners, healthcare industry employers and other stakeholders.

- While there are some useful approaches to measuring systems change, it is extremely difficult to attribute changes to any particular factor, especially at higher levels of a system. The extent to which HPOG has an effect on the health care sector as a whole will be much more difficult to determine than its effect on training in the health care sector in localities where HPOG is operating. However, including targeted surveys or interviews with employers or firms that are engaged with HPOG would be important and could suggest shifts in employer perspectives about training or in their hiring practices that can be informative. The HPOG NIE design plan includes surveys examining systems change and implementation issues with two groups of employers: all those actively involved in HPOG design or operations and a purposive sample of employers active in hiring HPOG graduates or with the potential to hire HPOG participants, such as large area healthcare employers.
- Systems change and implementation research are not entirely separable domains. Systems change, at the programmatic, institutional, or sectoral level, is often a major issue addressed using a range of implementation analysis methods. A comprehensive conceptual framework or logic model should integrate the two and guide the data collection and analyses. The HPOG NIE design plan envisions the systems change study as a special focus of the implementation research and conceptualizes systems change as a potential outcome of HPOG operations.
- A mix of structured and quantitative data collection and analysis, as well as more traditional qualitative approaches, is desirable to capture different perspectives (e.g., of staff, administrators, participants, employers, service partners) about implementation and systems change, create standard variables that can be included in the outcomes modeling, and consider the generalizability or replicability of findings for programs that might operate elsewhere. The relationships among program implementation and outcomes addressed by HPOG are complex, and it will be important to map inter-relationships among implementation factors. In addition to a series of surveys with largely close-ended response choices, the HPOG NIE and the HPOG Impact Study will also include more traditional on-site qualitative research.<sup>5</sup>
- At the lowest implementation level (e.g., classrooms, work units, programs), there are some very promising implementation science data collection and analytic methods that could produce standard measures of program services and strategies. Surveys, work activity logs, structured observations by multiple raters, and other detailed data collection at the work unit/classroom level can provide very accurate measures of staff activity and staff-student interaction. Surveys of staff in different organizations can produce measures of degree of interaction, quality of relationship, and other inter-organizational factors. Such data collection can be labor intensive, but could provide very useful and detailed information about strategies

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<sup>5</sup> The HPOG NIE design includes optional case studies of promising program designs and implementation strategies.

and service models. Specifically, the HPOG NIE includes surveys designed to produce standardized measures of implementation strategies and program design across multiple levels of program operations, including: case management divisions, multiple grantee program sites and grantee programs overall.

As the literature suggests, the HPOG NIE can use implementation analysis to address systems change (especially at the grantee, site, service provider and participating firm levels), document the implementation of HPOG programs, define the context within which each of the HPOG grantees and its sites are operating, and assess the quality of implementation or fidelity of selected models or strategies. The HPOG evaluation also provides the opportunity to advance the level of implementation analysis rigor. Specifically, the research approach will both ask *a priori* research questions and use hypotheses about program implementation to identify requirements, barriers, and facilitators of effective implementation and facilitators of systems change. Multi-method implementation analysis may be particularly appropriate to the HPOG evaluation, to go beyond traditional process studies that often employ only *ad hoc* approaches to the research questions and often focus mainly on diagnosing implementation problems. Integrating the implementation research and implementation science approaches in the HPOG NIE design is a particularly promising approach to better understanding the interaction of service components, service delivery strategies and results in HPOG programs.

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