Appendix A: OPRE's HPOG Research and Evaluation Strategy

Seven related HPOG research and evaluation projects are designed to identify what types of approaches work well in achieving the goals of HPOG, and in what circumstances and for whom they work, so they can be replicated in the future. The projects are as follows:

- **HPOG Implementation, Systems, and Outcome (ISO) Evaluation Design and Performance Reporting.** The HPOG ISO project has two parts. The first developed an evaluation plan for measuring the implementation, systems change, and outcomes of HPOG programs, including enrollment, program retention, training completion, job entry, employment retention and advancement, and earnings. The second built and maintains the HPOG Performance Reporting System (PRS), a management information system, to track grantee progress for program management and accountability and to record participant data for use in the evaluation.
- **HPOG National Implementation Evaluation (NIE).** The HPOG NIE is the execution of the study devised in the ISO evaluation plan (above). The NIE includes an in-depth examination of HPOG grantee program design and implementation, a systems analysis of networks created by HPOG programs (e.g., among grantees, employers, and other partners), and a quantitative descriptive analysis of HPOG program outputs and outcomes. Twenty-seven grantees—excluding the five tribal organizations—are included in this analysis.
- **HPOG Impact study.** The HPOG Impact study uses an experimental design to examine the effect of the HPOG program on participants' educational and economic outcomes. This evaluation aims to identify which components of HPOG programs (e.g., types of support services, program structure, and training areas) contribute to participant success. For some grantees, a multi-arm experimental design will be implemented, creating a control group that will not have access to HPOG, an "HPOG service as usual" treatment group, and an "enhanced HPOG" group that will receive additional supports and services. The 20 grantees that are not part of the Evaluation of Tribal HPOG, University Partnership Research Grants, or PACE evaluation are included in the HPOG Impact study.
- **Evaluation of Tribal HPOG.** A separate evaluation has been designed for the five tribal grantees, given the unique contexts in which these programs operate. This evaluation focuses on the implementation and outcomes for the tribal grantees.
- **Pathways for Advancing Careers and Education (PACE).** The PACE evaluation, formerly known as ISIS, is a nine-program experimental study of promising career pathway programs. Three HPOG grantees are included in the PACE study.
- **University Partnership Research Grants for HPOG.** These studies are being conducted by research partners at universities that have partnered with one or more HPOG programs to answer specific questions about how to improve HPOG services within local contexts.
- **Career Pathways Intermediate Outcomes (CPIO) study.** CPIO is analyzing the outcomes at 36 months after intake of participants in the HPOG Impact study and the PACE project. CPIO extends by almost two years the period in which participants can complete education and training activities and make progress in their careers and includes analysis of the intermediate steps (measured at 15 months) on participant outcomes and the effects of program participation on participants' children.

These research components are being coordinated to avoid duplication of effort, maximize the usefulness of collected data, reduce burden on grantees participating in the federal evaluation activities, meet performance management requirements, and promote cross-project learning.

Abt Associates, in collaboration with the Urban Institute, is conducting the ISO, NIE, Impact, and CPIO studies. NORC at the University of Chicago is conducting the Evaluation of Tribal HPOG, in partnership with Red Star Innovations and the National Indian Health Board. Abt Associates is conducting the PACE project. Five university research institutions are leading the University Partnership Research Grants: the Institute for Policy Research at Northwestern University, the School of Social Work at Temple University, the Institute on Assets and Social Policy at Brandeis University, the School of Social Work at Loyola University Chicago, and North Dakota State University.

Appendix B: Survey Implementation and Descriptive Analysis Methodology

Stakeholder/Network and Employer Survey Sampling Frame Process

In fall 2013, staff at each of the 49 HPOG program operators completed a sampling questionnaire in which they listed all organizations that they considered to be partners or stakeholders in their HPOG program. They identified the members of their program networks: organizations that were formal partners, informal partners, and stakeholder organizations. They also listed area employers that had hired HPOG participants or had been contacted by the program about hiring participants. For each organization reported, HPOG staff were asked to provide the name of a contact person.

To fully identify all members of the HPOG program network, research staff then conducted telephone follow-up with each formal partner identified by the program operators. The study asked formal partners to identify and provide contact information for any additional organizations that had helped plan or implement their HPOG program, along with any stakeholders who were not directly involved.

These two data collection efforts—the sampling questionnaire and the follow-up protocol—provided the comprehensive list of all partners and stakeholders in each of the 49 program networks. During sample framing, program operators and formal partners identified 999 organizations involved in HPOG grants. This number includes not only partner and stakeholder organizations and program operators, but also counts multisite grantees that oversaw several programs multiple times, one for each appearance in a program network.

Many organizations that were identified in the Sampling Frame Process did not have complete contact information and could not be included in the survey sample. Of the 999, the 852 partners and stakeholders with complete contact information received surveys. See Exhibit C.1 below. In addition to 852 partners and stakeholders, there were four multi-site lead grantees that were fielded customized surveys that included only the relevant portion of questions from the Stakeholder/Network Survey. These four surveys were transformed into 26 responses corresponding to each program network in which they were members. These responses were included in the formal network analysis though not the descriptive analysis.

Stakeholder/Network and Employer Survey Fielding

The study fielded the Stakeholder/Network and Employer Surveys, which serve as the basis for the descriptive analysis and the network analysis, in winter 2013-2014 to all organizations identified through the Sampling Frame Process.

The study combined three survey sources—the Stakeholder/Network survey, the combined Stakeholder/Network and Employer survey, and the Lead Grantee Stakeholder/Network survey—into a descriptive analysis file with 514 respondents. The study combined two sources—the combined Stakeholder/Network and Employer survey and the Employer survey—into a descriptive file with 146 respondents.

The study cleaned and recoded survey responses to ensure consistency. This process included assigning open-ended “other” responses to categorical questions into new or existing categories, dropping responses that were internally inconsistent, and dropping responses of organizations when appropriate.

There are some limitations to the survey data. In many instances, the survey asked questions retrospectively, as far as three years in the past. Retrospective data collection is often a challenge as respondents may not accurately recall or be aware of communication patterns between their organization and other HPOG network members for the time period before HPOG grants were awarded. Some respondents may have not been employed at the organization or may not have had the lead communication role at this earlier point in time. To the extent that errors in respondent recall affected the analytical results, it is possible that some statistics either over- or underestimate actual patterns of communication among HPOG network members immediately prior to the grant awards.

Another potential limitation is the possibility that some responses were biased in favor of the respondent's organization. However, in the case of HPOG, respondents did not have an incentive to overstate collaboration for several reasons: the HPOG Program did not explicitly require collaboration among partners as a primary outcome, only with the HPOG program operator, nor were a majority of the surveyed organizations specified as being required partners in the HPOG Program, and many organizations were not compensated by the program for their participation.

Exhibit B.1: Survey Sources for Descriptive Analysis

Survey	Description	Fielding Dates	Surveys Fielded	Surveys Completed and Included in Descriptive Analysis
Stakeholder/ Network Survey	Web-based survey sent to organizations identified by program operators and their formal partners as involved in or relevant to their HPOG programs.[a]	December 2013–March 2014	810	472
Stakeholder/ Network and Employer Survey	Web-based survey, a longer version of the Stakeholder/Network Survey that included supplemental questions from the Employer Survey, sent to organizations identified by program operators as both potential employers of participants and program partners.	December 2013–March 2014	42	16
Lead Grantee Stakeholder/ Network Survey	A shortened version of the Stakeholder/Network Survey sent to four multi-site lead grantees that oversaw several HPOG programs. For analysis purposes, these four surveys were transformed into 26 responses corresponding to each program network in which they were members. This allowed for analysis at the program network level.	March 2014	26	26
Total			**878**	**514**

Note: [a] An error in survey fielding required follow up with a portion of survey respondents to ensure that complete surveys were fielded. Survey questions that had been omitted in error from 104 surveys were collected separately in January and February 2014. In 15 cases, the omitted items were unable to be recovered.

Exhibit B.2: Survey Sources for Employer Analysis

Survey	Description	Fielding Dates	Surveys Fielded	Surveys Completed and Included in Analysis
Stakeholder/ Network and Employer Survey	Web-based survey, a longer version of the Stakeholder/Network Survey that included supplemental questions from the Employer Survey, sent to organizations identified by program operators as both potential employers of participants and program partners.	December 2013–March 2014	42	14
Employer Survey	Telephone and web-based survey fielded to employers that had been targeted for hiring participants but played no other program role	February–April 2014	266	132
Total			308	146

Descriptive Analysis Methodological Details

The descriptive analysis draws on the survey responses of 514 organizations that completed Stakeholder/Network surveys. The descriptive analysis examines 48 of the 49 networks because one had too few survey responses to be included. Response rates at the network level ranged from 21 to 100 percent.

Three primary features of the program networks shaped this analysis and the study used them to aggregate networks into groups: the type of program operator, whether the program was created for the HPOG grant or already existed, and the size of the network. See Exhibit C.3 for descriptions of survey respondents.

1. Across the 49 HPOG programs, **program operators** fell into four major types.
   - Twenty-four were higher education institutions (with 218 respondents);
   - Twelve were workforce development agencies (with 142 respondents);
   - Ten were non-profit organizations (with 74 respondents); and
   - Three were other government agencies (with 80 respondents).[1]
2. Twenty-nine programs (with 256 respondents) **existed before the HPOG grant**. The other 20 (with 258 respondents) were newly **created for the HPOG grant**.[2]
   - In describing the range of experiences, the report groups networks by the number of "members," or **size of the network**, where a member is a single organization (the program operator, a partner, or a stakeholder). For this report, small networks have three to ten members each, medium networks have 11 to 20 members each, and large networks have 22 and 72 members each. The median size of the HPOG networks was 14.
   - Of the 49 HPOG programs, 16 had small networks, 17 had medium-sized networks, and 16 had large networks.

- Across survey respondents, 66 belonged to small networks, 139 belonged to medium networks, and 309 belonged to large networks. This distribution is approximately proportional to the distribution of survey invitations across groups, ensuring that the completed survey responses effectively captured the perspective of all the different network sizes.

Given the range of programs and community contexts across the HPOG Program, it is not surprising that program networks varied in size. The size of a program's network was not fully within its control. Some local communities had fewer potential partners. Some programs may not have been appropriate for a large network. Moreover, workload can fluctuate, requiring more or fewer partners over time.

Examining differences between small and large networks, however, is an important analytic lens to apply because size is a key element of network dynamics.[3] The larger the network, the more likely it was that different types of organizations were represented, and the greater the opportunities were for network interaction. For some features, such as the inclusion of partner types, the results are not surprising; small networks were less likely to include certain partners, such as employers. Other results, such as the lack of stakeholder organizations with no particular program role within small networks, are less expected.

Exhibit B.3: Characteristics of the HPOG Networks

	Number of Networks	Average Network Size
All networks	49	20
By program operator type		
Higher education institution	24	22
Workforce development agency	12	18
Non-profit organization	10	14
Government agency	3	41
By network size		
Small	16	7
Medium	17	15
Large	16	40
By newness of HPOG program		
Pre-existing	29	18
Newly developed	20	24

Note: Average network size includes all organizations identified by program operators and formal partners. (See Appendix B for more information on the sampling frame.) The number of survey responses represents the number of organizations in the final analysis sample for the descriptive analysis.
Source: HPOG sampling questionnaire and follow-up protocol, 2013, and HPOG Stakeholder/Network survey, 2014.

Exhibit B.4: Characteristics of the Stakeholder/Network Survey Respondents

	Average Number of Survey Responses per Network	Number of Survey Respondents
All networks	10	514
By program operator type		
Higher education institution	9	218
Workforce development agency	12	142
Non-profit organization	7	74
Government agency	27	80
By network size		
Small	4	66
Medium	8	139
Large	19	309
By newness of HPOG program		
Pre-existing	9	256
Newly developed	13	258

Note: The number of survey responses represents the number of organizations in the final analysis sample for the descriptive analysis.
Source: HPOG sampling questionnaire and follow-up protocol, 2013, and HPOG Stakeholder/Network survey, 2014.

The study calculated and reports the results of the descriptive analysis in several ways. In many cases, the proportion of networks with a certain feature or perspective is of interest, so the study reports the number and percentage of networks with that feature or perspective. In other cases, it is more appropriate to present the proportion of a network's respondents who reported a certain survey response. In those cases, the study averaged 49 networks' proportions to describe the entire HPOG Program. In cases where the study assigned each respondent a score on a calculated index, it computed the average score across members within each network, and that value became the network-level score. (See Appendix C for details on indices.) The study then averaged network-level scores to describe the entire HPOG Program.

Appendix C: Scale Methodology

For the purposes of analysis, the study grouped a portion of the survey questions into 11 multi-question scales using confirmatory factor analysis, a statistical method which identifies whether certain items can be grouped into a single scale assessing the overall concept. The reliability of these scales is measured by an alpha score where a value closer to 1 indicates a stronger reliability of the scale. Each scale was found to be statistically reliable (i.e., a Cronbach's alpha of .7 or higher) and appropriate to represent a single underlying concept. For each scale, the study calculated scores as the numeric average of each respondent's answers to the questions making up that scale. The study excluded from the calculation missing and "Don't know" responses, as well as responses that included answers to fewer than half of the items in each scale.

Survey Items in Calculated Indices

Effectiveness at HPOG Collaboration (α=.972)

To what extent do you agree with each of the following statements about the collaboration among all partner organizations working on your local HPOG program?

In general, this effort had collaborative participation that was not dominated by any on group or sector.

In general, organizations working on your local HPOG program were effective in…

- Recruiting and retaining essential partners/stakeholders (both individuals and agencies/organizations).
- Gaining access to key local leaders and decision makers to support the objectives of HPOG.
- Reaching out and making connections to key healthcare employers.
- Gaining support and involvement of key healthcare employers.
- Using credible information/data to solve problems and support decision making.
- Developing and routinely communicating project activities and decisions to all partners/stakeholders.
- Establishing clearly defined roles for the partners/stakeholders.

In general, organizations working on your local HPOG program…

- Shared a common vision and achieved mutually satisfactory agreement on ground rules and norms for working together on the HPOG initiative.
- Effectively influenced and shared decision making on major issues affecting the operations of your local HPOG program.
- Were effective liaisons between their own organizations and the grantee institution.
- Were conscientious in ensuring their organizations responsibly implemented HPOG activities.
- Were willing to devote the effort and effectively shared resources needed to achieve your local HPOG program's goals.
- Worked collaboratively to identify new resources.
- Were generally respectful of one another, and trusted each other sufficiently to share information, perceptions, and feedback honestly and accurately.

To what extent do you agree with each of the following statements about the network of partners that support your local HPOG program? Here, we are asking about you overall perceptions of the collaborative enterprise, rather than the contributions of particular partners.

In general, HPOG partners/stakeholders…

Agree upon the key goals of your local HPOG program.

Agree upon the different responsibilities each organization should play in your local HPOG program.

Clearly and adequately communicate with each other about your local HPOG program.

Are equally committed to achieving the goals of your local HPOG program.

Challenges to Information Sharing (α=.739)

To what extent do you agree with each of the following statements about the collaboration among all partner organizations working on your local HPOG program?

In general, to what extent do you agree or disagree about the extent to which the following posed challenges to information sharing among different partner/stakeholder organizations?

Limited resources

Competition between organizations, i.e. turf issues

Local/state/federal policies and regulations

Organizational policies and practices

Current Organizational Support for HPOG Program (α=.847)

To what extent do the following organizations or groups currently contribute to the success of your local HPOG program? This can consist of providing direct resources, providing employment or training opportunities, or engaging in other activities that are beneficial to the success of your local HPOG program.

Employers

Social service providers

Training/education providers

Case management/counseling providers

Foundations

Local and state government organizations

Improvement in Organizational Support for HPOG Program (α=.884)

Since the grantee institution was awarded the HPOG grant, to what extent have the following groups become less helpful, stayed the same, or become more helpful?

Employers

Social service providers

Training/education providers

Case management/counseling providers

Foundations

Local and state government organizations

Achieving Desired Outcomes (α=.893)

To what extent do you agree with each of the following statements about the effectiveness of your local HPOG program in accomplishing the following goals? Here, we are asking about your overall perceptions.

Your local HPOG program is effectively…

Engaging targeted participants (i.e., TANF, low-income individuals).

Filling available positions in the local healthcare industry.

Developing career ladders for HPOG participants.

Producing graduates with the healthcare skills needed.

Organizational Satisfaction with HPOG Program (α=.929)

To what extent do you agree with each of the following statements about the satisfaction of people in your organization with each component of your local HPOG program? Here, we are asking about your overall perceptions.

In general, people in my organization have been satisfied with…

The program design of your local HPOG program.

The resource availability for your local HPOG program.

Your local HPOG program's adherence to its stated goals.

Your local HPOG program's ability to produce community awareness.

Your local HPOG program's placement success.

The job readiness of participants in your local HPOG program.

Organizational Satisfaction with HPOG Components (α=.963)

To what extent do you agree with each of the following statements about the satisfaction of people in your organization with each component of your local HPOG program? Here, we are asking about your overall perceptions.

In general, people in my organization have been satisfied with…

- Occupational training choices offered by your local HPOG program.
- Provision/content of occupational training offered as part of your local HPOG program.
- Adult education/GED instruction provided by your local HPOG program.
- Basic skills instruction provided by your local HPOG program.
- Case management provided by your local HPOG program.
- Academic and personal counseling provided by your local HPOG program.
- The availability of support services (i.e., child support, transportation, emergency assistance, etc.) provided by your local HPOG program.
- Work-based learning opportunities coordinated by your local HPOG program (i.e., internship/apprenticeship, job shadowing, etc.).
- Your local HPOG program's collaboration with employers.
- Your local HPOG program's placement opportunities.

Challenges to HPOG Programs' Success (α=.895)

To what extent have the following been challenges to the success of your local HPOG programs?

- Adequacy of resources needed to fully prepare your local HPOG program participants
- Adequacy of time needed to fully prepare your local HPOG program participants
- Articulation of a clear vision for the project
- Employers' awareness of your local HPOG program
- Employers' confidence in your local HPOG program graduates
- Identification of prospective applicants who are likely to succeed with the training
- Mix of available services to support breadth of participant needs
- Organization and management of your local HPOG program
- Participants' personal barriers and their ability to follow through with the program
- Quality of available training

Perceptions of HPOG Sustainability (α=.942)

On a scale of 1 to 5, where 1=Strongly Disagree and 5=Strongly Agree, please indicate the extent to which you agree with the following statements about the sustainability of changes that occurred under HPOG after the HPOG grant period ends. Here, we are asking that you generalize about your relationship with the grantee institution, and with the group of other HPOG partners rather than each one individually.

After the end of the HPOG grant period…

- The grantee will continue to work with my organizations to provide healthcare training to low income individuals in the community.
- Other HPOG partners will continue to work with my organization to provide healthcare training to low income individuals in the community.
- The grantee will continue to work with my organization to provide support services for sectoral training programs.
- Other HPOG partners will continue to work with my organization to provide support services for sectoral training programs.
- Changes to administrative procedures or policy at the state or local level that were initiated by HPOG will remain in place.

Challenges to HPOG Sustainability (α=.765)

Which of the following represents challenges to the sustainability/future of HPOG-related activities after the end of the HPOG grant?

- Unfavorable economic conditions
- Excess of labor supply (i.e., too many new low- to mid- skilled healthcare graduates)
- Lack of common mission among partner organizations
- Lack of organizational resources within the grantee institution (e.g., budget, staff, equipment, space)
- Not producing enough trained workers
- Not producing workers with the right skill mix

Appendix D: Network Analysis Methodology

This appendix presents additional information regarding the methodological techniques used to conduct the network analysis in Chapter 4. The sections below provide information about the survey data used, network analysis terminology, units of analysis, measurement development and comparison approach, potential limitations, network analysis size, missing data imputations, adjusted average network values, detailed results not included in the report, as well as sociograms documenting some examples of individual networks that showed improvement on key measures.

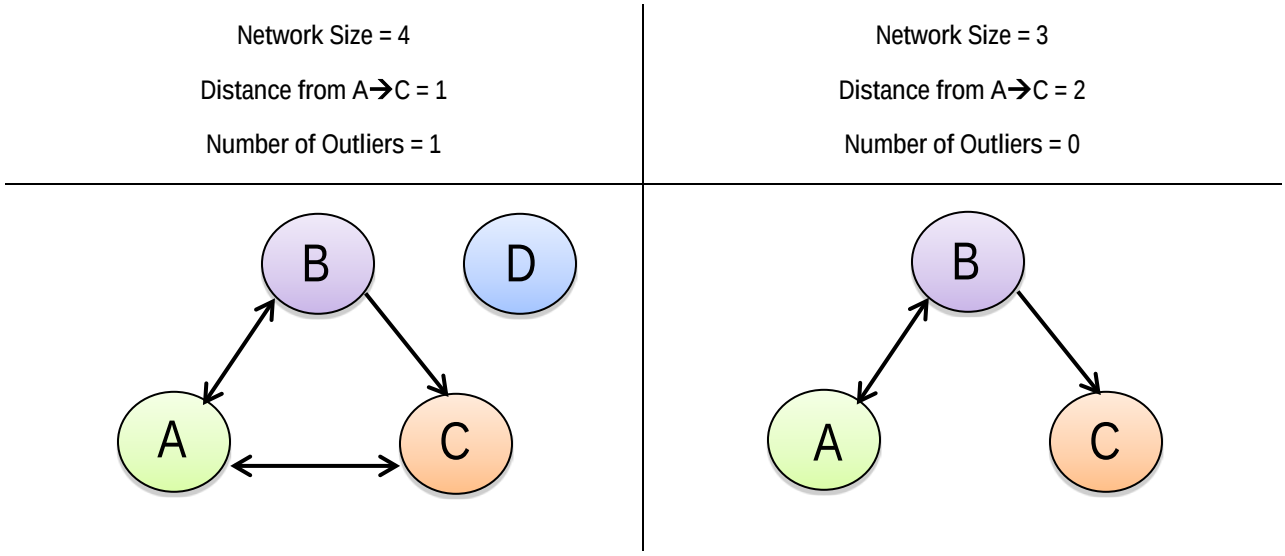
Details of Data Used for Network Analysis

The formal network analysis is based on the portion of the Stakeholder/Network and Grantee surveys that asked each organization the same questions about collaboration with all other members of its network. From these questions, it was possible to determine the level of collaboration with organizations that did not respond to the survey. Thus, the network analysis includes nearly all partners and stakeholders and all 49 program operators (917 organizations). The four multisite grantees that oversaw multiple programs were also included. (See Appendix B above on details of survey fielding.)

Network Analysis Terminology

The HPOG network analysis in this report examines the connections (**ties**) between HPOG network members (**nodes**), where each network member was a single organization. As shown in Exhibit E.1, an important network statistic is its **size**, which is the number of members it contains. Following previous research by Yahner and Butts,[4] ties were established from survey responses indicating the presence of regular helpful interactions between organizations. Because the surveys asked organizations about the helpfulness of each other, ties could be **reciprocal** (meaning both organizations reported helpful interactions with the other) or **one-way** (meaning one organization found the other helpful, but not vice versa). In Exhibit E.1, the tie between A and B is reciprocal, but the tie between B and C is one-way (B finds C helpful but not the other way around). Another basic network statistic is the **distance** between network members, which is measured as the smallest number of ties (also referred to as degrees of separation) between them (regardless of the direction of the ties). For example, in Exhibit E.1, to calculate the distance between members A and C, the analysis looks at whether they interacted directly with one another (distance equals 1) or only indirectly through member B (distance equals 2, because A has to interact with B to reach C). If a member has no direct or indirect ties with other network members, it is considered an **outlier** (D), for whom distances cannot be computed.[5] The study used these basic concepts of ties and distance between nodes to calculate the nine key network statistics used in the network analysis (see Exhibit E.2 for definitions of the network measures).

Exhibit E.1: Illustration of Basic Network Statistics



Units of Analysis

The HPOG network analysis examined the interactions of HPOG program operators and partner and stakeholder organizations involved in each of the 49 program networks to compute network-level measures of the nature of collaboration and to describe the structures of the networks themselves. The primary unit of analysis is the program network.

As a secondary unit of analysis, the study examined role of the program operator within each of the 49 networks. The study used organization-level features of the organization, produced by the network analysis, to distinguish networks in which the program operator played a very central (powerful) and involved (instrumental) role in facilitating collaboration from those networks in which the program operator was either less instrumental or less powerful.

The network analysis also examined the interactions of different types of organizations within the 49 HPOG networks to explore the degree of collaboration across different organizational types. Accordingly, the study collapsed network members into the type they represented (i.e., workforce development agency, business sector, education and training, non-profit, or government agency), and reexamined the network measures of density and cohesion. When examining the presence of helpful interactions across types, density and cohesion can be construed as proxy measures for cross-type integration; as each increases, there is a greater likelihood that collaborative resource sharing and articulation of common goals has occurred.[6]

Network Measures Developed

As social network analysis has developed over the past 50 years, a set of network measures has emerged.[7] The benefit of network analysis is that a large number of statistics can be extracted from just one or two questions posed to all network members. The challenge is that there is no universally accepted, standard network terminology or pre-specified set of network measures that are widely used. For the HPOG network analysis, it was critical to identify and define the most relevant network measures for the project's substantive analytic goals. The HPOG network analysis examines a key set of network measures to inform whether and how collaboration within the HPOG service delivery partnerships changed across

time and varied among HPOG programs. See Exhibit E.2 for the measures used in the current network analysis.

Exhibit E.2: Measures Developed for the Network Analysis

Measure	Definition	Range of Values
Closeness		
Proximity	Average minimum number of helpful ties needed to link any one member organization to another. A 1 means that two organizations communicate directly.	1 to (network size - 1)
Connectedness		
Density	Helpful ties among organizations as a share of all possible helpful ties.	0 to 100%
Cohesion	Reciprocally helpful ties among organizations as a share of all possible reciprocally helpful ties.	0 to 100%
Cross-type density	Helpful ties across organization types as a share of all possible helpful cross-type ties.	0 to 100%
Cross-type cohesion	Reciprocally helpful ties across organization types as a share of all possible reciprocally helpful cross-type ties.	0 to 100%
Equality [a]		
Power equality	Equal distribution of incoming ties. A 0 means that one organization is responsible for all the helpful ties; a 100 indicates that credit for helpful ties is spread equally among all organizations.	0 to 100%
Instrumental equality	Equal distribution of outgoing ties. A 0 means that one organization reports having helpful interactions with other organizations; a 100 indicates that all organizations report equally helpful interactions.	0 to 100%
Program operator power	Incoming helpful ties held by the program operator as a share of all possible incoming helpful ties (i.e., the share of network members who report receiving regular, helpful interactions from the program operator.)	0 to 100%
Program operator instrumentality	Outgoing helpful ties held by the program operator, as a share of all possible outgoing helpful ties (i.e., the share of network members with whom the program operator reports receiving regular, helpful interactions.)	0 to 100%

Note: For each measure, the unit of measurement is a pair of network member organizations. Pairwise scores are aggregated for all possible pairs of organizations in a network.
The study adapted key measures from John K. Roman, Jeffrey A. Butts, and Caterina Gouvis Roman, "Evaluative systems change in a juvenile justice reform initiative," *Children and Youth Services Review* 33, no. 1 (2011): S41-S53..
[a] Power equality equals 100% minus the amount of variability in the incoming ties of organizations in the observed network as a percentage of that in the most unequal possible network of the same size. Instrumental equality is the same but for outgoing ties.

To understand the nature of collaboration and cross-sector integration in the HPOG networks before and after the grant was awarded, the study computed these network-level measures using the Ucinet software program, and visual sociograms of a select set of networks, presented as examples, were developed using NetDraw.[8,9] The examinations involved comparisons of network measures across time (based on retrospective collection of pre-grant measures) and to those for an average HPOG network of the same size.

Comparing Networks

To assess *individual HPOG networks'* collaboration performance over time, the study considered the direction of change across time in each measure for each HPOG program, along with the network's performance relative to that of the average HPOG network of a given size, for each collaboration measure. These averages are adjusted for network size, response rate, and agreement rate; see Adjusted Average Network section below for details.

For each measure, the study divided networks into those that showed improvement and those that did not. Then, within these two categories, the analysis grouped networks according to whether their collaboration performance three years into the grant was at or above, or was below, that of the average HPOG program network with similar characteristics (adjusted for size, response rate, and agreement rate). This grouping led to four mutually exclusive categories of collaboration performance:

- "**Improved and ended at or above average**" refers to HPOG networks whose collaboration measures improved over the three years and ended equal to or higher than the average value for a similar network; this group includes networks that started below, at, or above average.
- "**Improved but ended below average**" refers to HPOG networks whose collaboration measures improved over the three years but remained below the average for similar networks.
- "**Did not improve but ended at or above average**" refers to HPOG networks whose collaboration measures stayed the same or declined over the three years but still ended at or above the average values for similar networks.
- "**Did not improve and ended below average**" refers to HPOG networks that neither improved nor reached the average value for similar networks.

The study calculated these assessments for each of the 49 HPOG programs for each of nine collaboration measures; thus, the same HPOG network could have one collaboration measure improve and end above average, while another collaboration measure could show no improvement and end below average. Because a vital outcome of interest is increased collaboration among local organizations, the discussion focuses on whether networks improved collaboration. Results for networks that remained the same or decreased are grouped together under the rubric "did not improve." Since there is no specific hypothesis on why the HPOG programs would lead to decreased collaboration, there is no separate discussion of networks for which measures declined versus remaining the same.

Limitations

Because of the way in which the Grantee and Stakeholder/Network surveys collected network measures from HPOG program network members, there are several potential limitations of the network analysis data. Typically, stakeholder surveys in a project assessing change field multiple waves (often semi-annually or at least annually) to representatives of the program operator, key partners, and other critical stakeholders; program operators identify potential respondents based on who they perceive as most informed about the program. When a survey uses multiple waves, program operators may alter the respondent selections over time to reflect new partners or stakeholders that emerge as instrumental to the success of the program, or conversely, to eliminate those who are no longer engaged for a variety of reasons. This kind of survey implementation could not be achieved for the HPOG Program, largely due to the lag between program implementation and the planned data collection. As a result, the study designed the Grantee and Stakeholder/Network surveys to capture respondents' feedback for multiple time periods

in a single survey; i.e., the study designed questions to capture retrospective information on circumstances prior to or at the inception of the HPOG Program, and then—with identically-worded items—to elicit responses regarding circumstances at the time of survey administration. This approach permits analyses of reported changes over time with a single survey.

More specifically, for the network analysis, the surveys asked questions about the frequency and helpfulness of communications with all network organizations retrospectively for the period before the HPOG grants were awarded and currently for the time at which surveys were administered (i.e., over three years later). The instrument format included distinct sections that clearly referenced specific timeframes in the instructions to respondents (i.e., "for this set of questions, please respond based on your relationships *before* the program operator was awarded the HPOG grant in October 2010"; "for this set of questions, please respond based on your *current* relationships").

As the HPOG network analysis relies on retrospective data, it is possible that information on communication for the period prior to the awarding of HPOG grants may be measured with error. The surveys asked individuals in organizations to recall communication with other organizations roughly three years prior to the time they were surveyed. There is no clear expectation on whether errors at baseline are more likely to lead to over- or underestimates of communication levels. Another type of error is bias in reporting of communication at Year 3 due to both measures being reported in the same survey. The concern here is that some respondents may have answered the questions so as to show improved collaboration over time, either consciously or unconsciously, either through overstatement of current communication or understatement of baseline communication. This would bias the results toward increased communication over time. However, the potential for this bias is mitigated by several factors. First, the HPOG Program did not explicitly require collaboration among partners as a primary outcome, only with the HPOG program operator. Thus, survey answers about communication with all other organizations in the network are less likely to have this bias. Also, a majority of the surveyed organizations were not specified as being required partners in the HPOG Program, so likely had less of a sense of ownership of the project, a perspective buttressed by the fact that most were in no way compensated by the program for their participation. For more information on the Stakeholder/Network survey, please see Appendix B.

Network Analysis Size

The sampling frame process was intended to capture all HPOG partners and stakeholders, with "stakeholders" including organizations not directly involved in the HPOG Program but interested in its outcomes. The network analysis perspective considers a somewhat narrower set of organizations. An issue arises in dealing with survey non-respondents among the organizations classified as part of a network. The analysis needs to separate out survey non-respondents that were not truly part of the HPOG network in question from those that were involved and relevant and simply failed to respond to the survey. For the latter group, the study needs to impute rather than ignore missing network responses, as described in the next section. It is particularly important to exclude irrelevant organizations in the calculation of the network size because size is used (as described in a subsequent section) for comparing observed network measures to their average values.

As shown in Exhibit E.3, the analysis constructed network analysis size from the network size by removing any non-respondents with whom no responding organizations indicated a helpful tie.[10] (The final two columns of the exhibit are discussed in the next section of the appendix.) Thus, the study retained all organizations who responded to the Stakeholder/Network and Grantee surveys, as well as

those non-respondents with whom at least one helpful tie was indicated—either pre-HPOG-grant or three years later—by at least one responding organization. On average, the network analysis size represented 96 percent of the original network size, suggesting that few truly irrelevant organizations were identified during the sampling frame.[11] Network analysis size is an important control variable in interpreting the performance or strength of a network.

Exhibit E.3: Network Analysis Size, Response Rate, and Agreement Rate

Grantee ID	Network Size	Non-Respondents with No Helpful Ties	Network Analysis Size[a]	Response Rate[b]	Agreement Rate[c]
10	19	0	19	42%	71%
11	10	2	8	50%	50%
12	9	0	9	78%	71%
13	12	0	12	50%	87%
14	11	0	11	45%	80%
15	13	3	10	60%	60%
16	26	0	26	62%	78%
17	6	0	6	50%	100%
18	33	0	33	45%	65%
19	14	0	14	57%	79%
20	3	0	3	100%	50%
21	20	0	20	55%	72%
22	9	0	9	78%	74%
23	11	0	11	36%	67%
24	9	0	9	78%	64%
25	10	0	10	80%	36%
26	30	2	28	57%	67%
27	27	0	27	37%	67%
28	6	0	6	83%	75%
29	14	0	14	36%	90%
30	8	0	8	50%	75%
31	39	17	22	36%	94%
32	7	0	7	29%	100%
33	19	0	19	37%	50%
34	48	1	47	19%	92%
35	14	0	14	57%	64%
36	15	0	15	87%	65%
37	22	0	22	95%	75%
38	11	0	11	64%	79%
39	17	0	17	65%	56%
40	46	5	41	37%	79%
41	7	2	5	60%	100%
42	14	0	14	71%	63%

Grantee ID	Network Size	Non-Respondents with No Helpful Ties	Network Analysis Size[a]	Response Rate[b]	Agreement Rate[c]
43	30	0	30	67%	59%
44	72	13	59	66%	77%
45	69	19	50	36%	64%
46	5	0	5	80%	58%
47	31	0	31	55%	71%
48	22	0	22	59%	72%
49	7	0	7	57%	50%
50	17	1	16	44%	71%
51	8	0	8	88%	69%
52	70	17	53	32%	61%
53	36	0	36	69%	71%
54	9	0	9	56%	85%
55	4	0	4	100%	58%
56	34	0	34	59%	61%
57	12	0	12	67%	61%
58	14	0	14	64%	75%

Note: [a] The network analysis retained non-respondents with one or more helpful ties and all respondents regardless of ties.
[b] Equals the number of respondents to the network survey questions divided by the network analysis size.
[c] Equals the number of ties where both responding organizations agreed on helpfulness (or lack thereof) divided by the total number of ties where both organizations' responses were known.
Source: HPOG Network Analysis, HPOG Stakeholder/Network Survey
N=49 HPOG program networks

Missing Data Imputation

Network analysts are frequently confronted with problems of missing data due to non-response among organizations believed to be part of a network. These data omissions can inhibit analysts' ability to generate accurate pictures of the connections among network members.[12] For example, imagine that in a network of 100 potentially relevant organizations only the ten most centrally involved organizations respond to a network survey. Any network analysis of just those ten organizations' responses would present a false picture of a well-coordinated network, whereas complete imputation of data for the missing 90 organizations could present a false picture of a highly fragmented network. Yet, ultimately, the network analyst has only these two choices when facing incomplete data: ignore it or impute.[13] The HPOG network analysis adopted both strategies. As discussed in the previous section, the analysis ignored missing data for non-respondents with whom no helpful ties were indicated by survey respondent organizations in the network. The study viewed these non-respondents s irrelevant to the network and excluded from subsequent consideration. For the remaining missing data for non-respondents with whom responding organizations indicated at least one helpful tie (i.e., organizations determined to be relevant to the HPOG networks), the study used simple imputation methods.

First, the study examined the rate of agreement regarding helpful ties between organizations that responded to the survey to understand the extent to which helpful interactions were reciprocated by the other party. The study calculated the agreement rate as the number of ties where both responding

organizations agreed on helpfulness (or lack thereof) divided by the total number of ties where both organizations' responses were known. There was a high level of agreement across all networks, averaging 70 percent (see Exhibit E.3). This high level of agreement helped to justify the next step, which was to impute the presence (or lack) of helpful interactions for organizations with network members who indicated a helpful interaction (or lack of helpful interaction) with them. For other types of missing data, when no better information was known about a non-respondent's relationship to others in the network, the network analysis erred on the side of caution and assumed no helpful interaction was present.[14] As with all imputation approaches, there was neither a guarantee, nor an expectation of complete accuracy with this approach. It is likely that some helpful ties between responding and non-responding organizations were not reciprocated, and it is likely that some non-respondents had additional helpful relationships with others that were not reciprocated. However, it is reasonable to believe that these errors resulting from imputation are distributed generally equally across HPOG program networks such that network analyses that focus on the average level of change across HPOG networks are generally accurate, and that examinations of HPOG networks' individual performances against those for the average network of similar size will be accurate to the extent that agreement rate and response rate are incorporated as predictors of expected values, as described in the next section.

Adjusted Average Network Values

A limitation of network analysis is that direct comparisons of network measures across networks of different sizes can be misleading. Smaller networks have fewer possible ties, and relationships between members may be more easily established and maintained. It would be unfair to expect larger networks to have the density and cohesion among partner organizations that may be reported by smaller networks. Similarly, networks with higher response rates and/or greater agreement among respondents may differ from those with lower response rates or less agreement. To accommodate such limitations, the HPOG network analysis compared network measures to the average expected values for a network of equal size, response rate, and agreement rate.

Toward this end, the analysis estimated a series of ordinary least squares (OLS) regressions, each of which used one network measure (i.e., pre-HPOG proximity) as the dependent variable and had as the independent variables: network analysis size, network response rate, and network agreement rate (see Exhibit E.4). These regressions allowed measurement of the relationships between the independent variables and the various network collaboration measures at each time point, as observed among the 49 HPOG networks. As shown in Exhibit E.4, the F-statistic was statistically significant in the majority of the models, indicating that the collective association of the independent variables to the dependent variable was significant. Further, the R-squared values—which measure the amount of variance in the dependent variables explained by the predictors—were .24 or higher in eight models (a sizable number for social science analyses) and 0.1 or higher in seven of the remaining ten models.

The study used the predicted values from these regressions as the adjusted average values (based on the observed regression trend line) for all of each network's collaboration measures: proximity, density, cohesion, cross-type density and cohesion, power and instrumental equality, and program operator power and instrumentality. The study then use these values to judge where and when HPOG networks performed at or better than average.

Exhibit E.4: Model Summaries from Regressions Computing Adjusted Average Network Values

Dependent Variable	Independent Variables	F-statistic	R^2
Proximity before HPOG	Network Analysis Size*, Response Rate, and Agreement Rate†	5.339**	0.26
Proximity 3 years later	Network Analysis Size***, Response Rate, and Agreement Rate	9.227***	0.38
Density before HPOG	Network Analysis Size***, Response Rate, and Agreement Rate	9.409***	0.39
Density 3 years later	Network Analysis Size***, Response Rate†, and Agreement Rate	17.706***	0.54
Cohesion before HPOG	Network Analysis Size**, Response Rate, and Agreement Rate	4.892**	0.25
Cohesion 3 years later	Network Analysis Size***, Response Rate, and Agreement Rate	7.710***	0.34
Cross-type Density before HPOG	Network Analysis Size*, Response Rate, and Agreement Rate	1.919	0.11
Cross-type Density 3 years later	Network Analysis Size, Response Rate, and Agreement Rate	1.052	0.07
Cross-type Cohesion before HPOG	Network Analysis Size†, Response Rate, and Agreement Rate	2.425†	0.14
Cross-type Cohesion 3 years later	Network Analysis Size, Response Rate, and Agreement Rate	2.04	0.12
Power Equality before HPOG	Network Analysis Size, Response Rate**, and Agreement Rate	4.761**	0.24
Power Equality 3 years later	Network Analysis Size, Response Rate*, and Agreement Rate*	8.137***	0.35
Instrumental Equality before HPOG	Network Analysis Size, Response Rate, and Agreement Rate	1.33	0.08
Instrumental Equality 3 years later	Network Analysis Size, Response Rate, and Agreement Rate	1.629	0.10
Program Operator Power before HPOG	Network Analysis Size*, Response Rate, and Agreement Rate	2.438†	0.14
Program Operator Power 3 years later	Network Analysis Size†, Response Rate, and Agreement Rate†	2.558†	0.15
Program Operator Instrumentality before HPOG	Network Analysis Size, Response Rate, and Agreement Rate	0.635	0.04
Program Operator Instrumentality 3 years later	Network Analysis Size, Response Rate, and Agreement Rate	1.877	0.11

Note: Statistical significance: † $p<.10$, * $p<.05$, ** $p<.01$, *** $p<.001$
Source: HPOG Network Analysis, HPOG Stakeholder/Network Survey
N=49 HPOG program networks

Detailed Network Analysis Results

Exhibit E.5: HPOG Programs' Network Collaboration Measures before and after the HPOG Grant Award

Measure	Before HPOG Grant Mean Percent (SD)	Three Years Later Mean Percent (SD)	Mean Difference Percent	T-statistic	Actual Performance
Closeness					
Proximity	4.5[a] (5.8)	2.4[a] (1.3)	-2.1%	-2.6*	Improved
Connectedness					
Density	32.5% (14.7%)	37.2% (16.3%)	4.70%	3.8***	Improved
Cohesion	26.3% (13.4%)	31.6% (16.5%)	5.30%	3.1**	Improved
Cross-type density	74.9% (20.9%)	81.7% (16.5%)	6.80%	3.5***	Improved
Cross-type cohesion	69.2% (25.4%)	78.5% (20.7%)	9.30%	3.5***	Improved
Equality					
Power equality	58.0% (15.1%)	51.2% (15.9%)	-6.80%	-3.1**	Declined
Instrumental equality	48.2% (13.2%)	43.3% (17.2%)	-4.90%	-1.7†	Declined
Program operator power	60.3% (17.6%)	76.4% (20.3%)	16.10%	5.6***	Improved
Program operator instrumentality	50.5% (29.6%)	79.4% (21.2%)	28.90%	7.1***	Improved

Note: Statistical significance: † $p<.10$, * $p<.05$, ** $p<.01$, *** $p<.001$. SD = standard deviation.

[a] Proximity refers to the average number of helpful ties, so it is a number not percentage.

Source: HPOG Network Analysis, HPOG Stakeholder/Network Survey Q17, 18, 20, 21, 23.

N=49 HPOG program networks

Exhibit E.6: Comparison of HPOG Programs' Network Characteristics and Collaboration Performance

	Performance Measures Three Years after Grant				
Network characteristic	**Proximity Mean[a]**	**Density Mean**	**Cross-Type Cohesion Mean**	**Number of Collaborations that Improved and Ended at or Above Average**	**Number of Collaborations that Did Not Improve but Ended at or Above Average**
Program operator type					
Non-educational (N=25)	2.196	0.369	0.856	2.000	0.880
Educational (N=24)	2.651	0.375	0.711*	1.292	1.083
Size					
Small (N=16)	1.736	0.525	0.717	1.938	0.938
Medium (N=17)	1.952	0.359	0.772	1.353	1.118
Large (N=16)	3.598***	.233***	0.867†	1.688	0.875
Presence of all required partners					
Missing all (N=28)	2.301	0.390	0.736	1.571	0.750
All present (N=21)	2.576	0.348	0.851†	1.762	1.256
Presence of business-sector organizations					
No business organizations (N=19)	1.758	0.485	0.786	2.000	1.158
Business organizations present (N=30)	2.838**	0.300***	0.785	1.433	0.867
Newness of HPOG program					
Pre-existing (N=29)	2.219	0.393	0.795	1.621	1.103
Newly developed (N=20)	2.710	0.341	0.770	1.700	0.800

Note: Statistical significance of differences in performance measure by network characteristic: † $p < .10$, * $p < .05$, ** $p <. 01$, *** $p <. 001$. Significance is based on two-sample, two tailed *t*-test assuming equal variances. For comparisons by network size, *t*-test is between small and large networks.

[a] Proximity refers to the average minimum number of helpful ties between organizations, so it is a number rather than a proportion.

Source: HPOG Network Analysis, HPOG Stakeholder/Network Survey Q17, 18, 20, 21, 23.

N=49 HPOG program networks

Sociograms Documenting Individual Networks' Collaboration Performance

This section presents examples of HPOG program networks' collaborative performance using *sociograms*. Each set of sociograms depicts a real network's configuration before HPOG program implementation and three years later. The four examples show networks with increased proximity, increased density, increased cohesion, and increased cross-type density. The depicted networks increased and ended above average for each of these measures, respectively. Exhibit E.7 explains how the sociograms are constructed.

Exhibit E.7: Understanding the Sociograms for HPOG Network Analysis

Sociograms represent visually how organizations within networks interact. The sociograms on the following pages depict some important network measures and display how networks' collaborative performance may have improved during the HPOG grants.

The sociograms show helpful ties between organizations as arrows. The direction of the arrow indicates the direction of the helpful tie; when an arrow goes from organization A to organization B, it means that organization A reported having regular, helpful interactions with organization B. When an arrow goes both ways, it means that organization B reported helpful ties as well—that is, the helpful ties were reciprocated.

Each organization is depicted with a particular color and shape to illustrate its organizational type, as listed below.

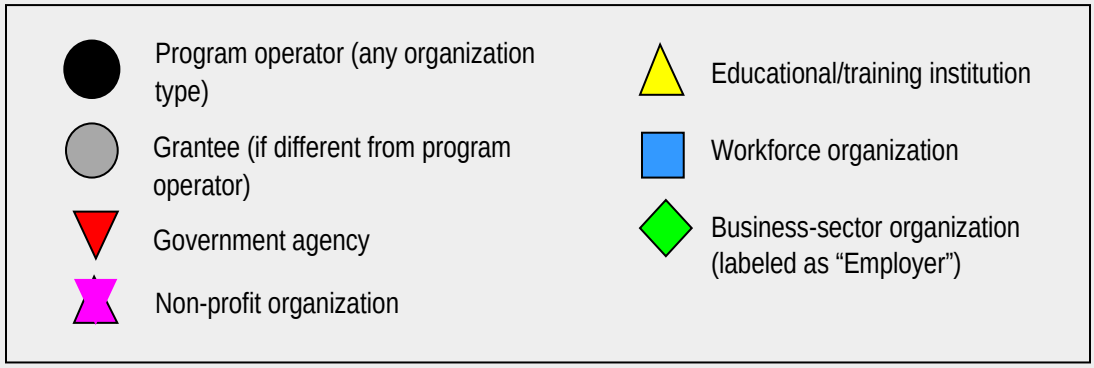


Exhibit E.8 illustrates an HPOG program network that created strong direct connections between members that improved during the grant. In this example, the program operator (an educational institution) led a large network, heading up an HPOG program that supported students in a variety of non-credit healthcare trainings. Its HPOG program featured a robust externship program that relied on relationships developed with local healthcare providers. This sociogram clearly shows the change over time of the network, namely improved ties with healthcare employers. Before the HPOG grant, a large number of business organizations (local healthcare providers) had no connection to the program operator. Three years later, the program operator was highly connected to many local employers, though these employers were rarely connected to additional organizations in the highly centralized network. In the sociogram, almost every network member has a proximity score of 1 with the program operator (interacting directly with it) and a proximity score of 2 (only two degrees of separation) with all other

network organizations. Before the HPOG grant, all the unconnected businesses had proximity scores of 47—the total number of organizations in the network.

Exhibit E.9 illustrates improved density performance for a small network led by a program operator (an educational institution) focusing on preparing participants for allied health, nursing, and health information technology (IT) occupations. Before the HPOG grant, only four of the 12 possible one-directional helpful ties in this network were active; three years later, seven were active. Before the HPOG grant, the education and training institution was not collaborating with any network members; after three years, it had been integrated and was in a reciprocated helpful relationship with the program operator.

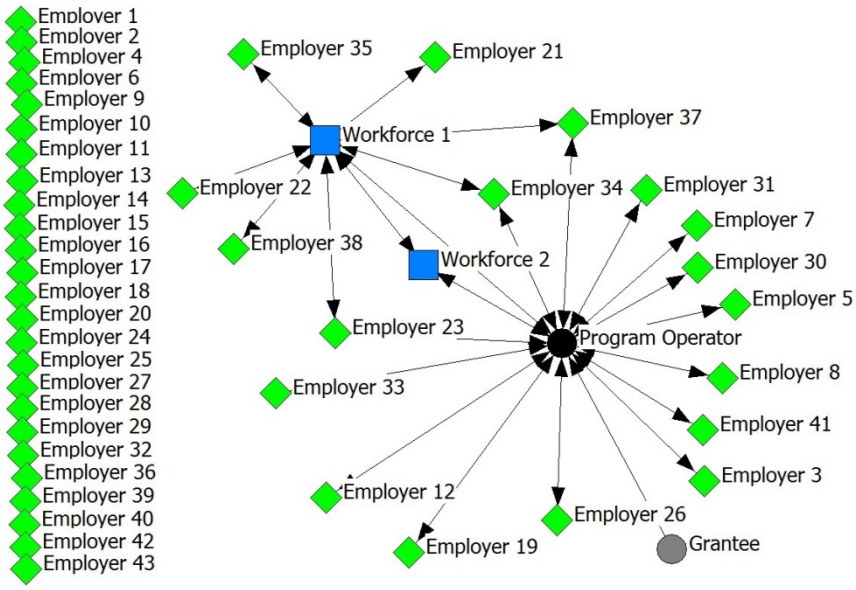
Similarly, Exhibit E.10 shows improved cohesion for a medium-sized network led by a program operator (an educational institution) focused on training for allied health, long-term care, health IT, and nursing. Network members were working with each other in mutually beneficial ways after three years of the HPOG grant with extensive reciprocally helpful ties. The program operator reported more numerous ties after the HPOG grant was awarded—thereby moving it closer to the center of the entire network—while two workforce development organizations remained as centrally involved as they were before the grant.

Exhibit E.11 illustrates a non-profit program operator with a medium-sized network whose cross-type density measures improved during the HPOG grant. In this example, each node represents all organizations of a given type rather than a single organization. The network's organizational types achieved a near-perfect star after three years of the HPOG grant: direct, helpful ties between every possible pairing of organization types, except an unrealized link between the non-profit and business-sector organizations. In contrast to before the HPOG grant, the program operator had effective ties with organizations of every type. The workforce and educational/training network members also both connected with all other service domains.

Exhibit E.8: Illustration of Improved Network Proximity

This sociogram shows a large network where the program operator effectively brought in many new employer partners. Many business organizations, appearing on the left in the first sociogram, were disconnected from the network before the HPOG grant began. They were all integrated into this centralized network by three years into the grant, working directly with the program operator to provide externships for training participants.

Before HPOG Grant:



Three Years Later:

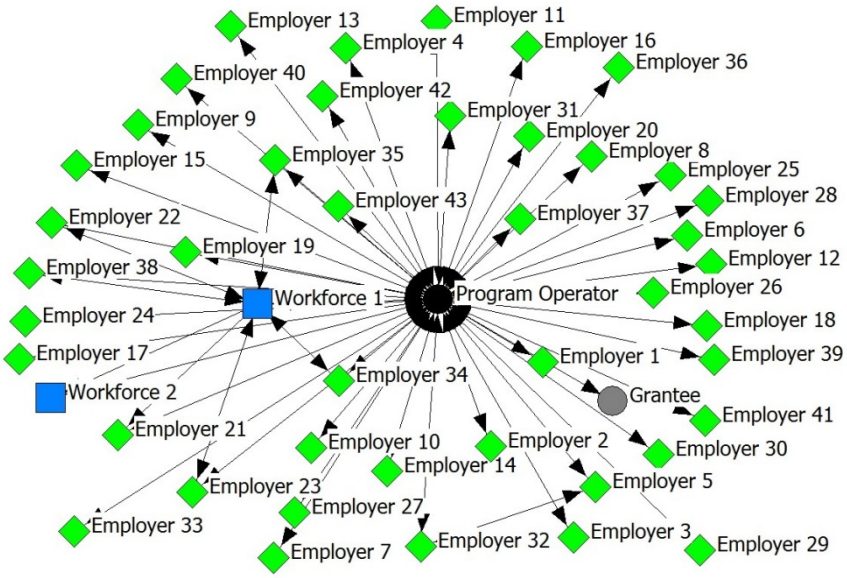
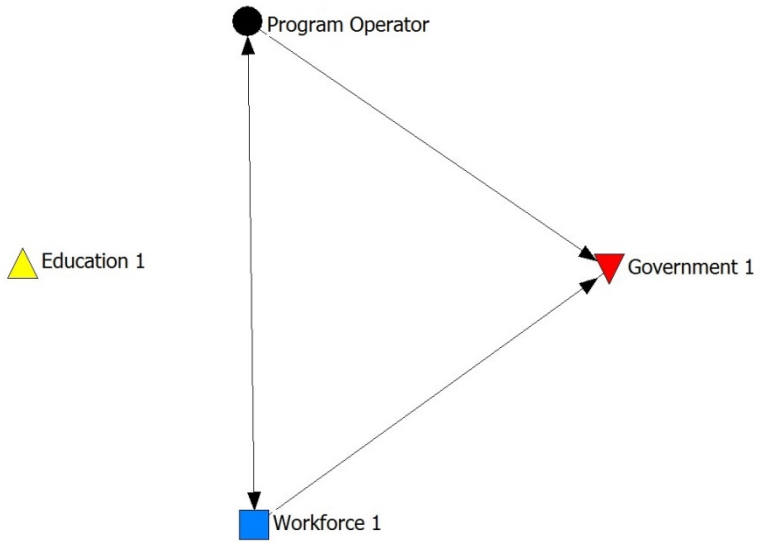


Exhibit E.9: Illustration of Improved Network Density

This sociogram shows a small network comprised of a program operator and three network members, where more of the potential working relationships became active over the grant period. Before the HPOG grant began, only three relationships were active out of six possible; three years after the grant began, an educational institution was integrated, and there were five working relationships in action.

Before HPOG Grant:



Three Years Later:

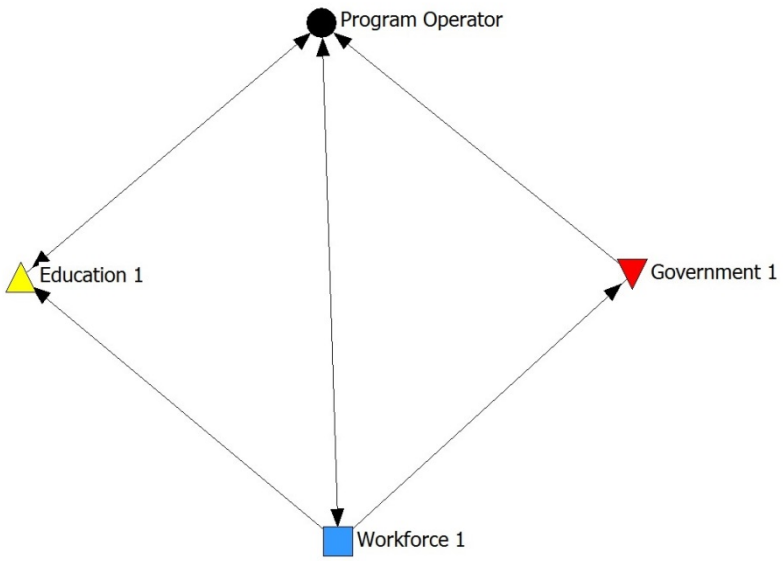
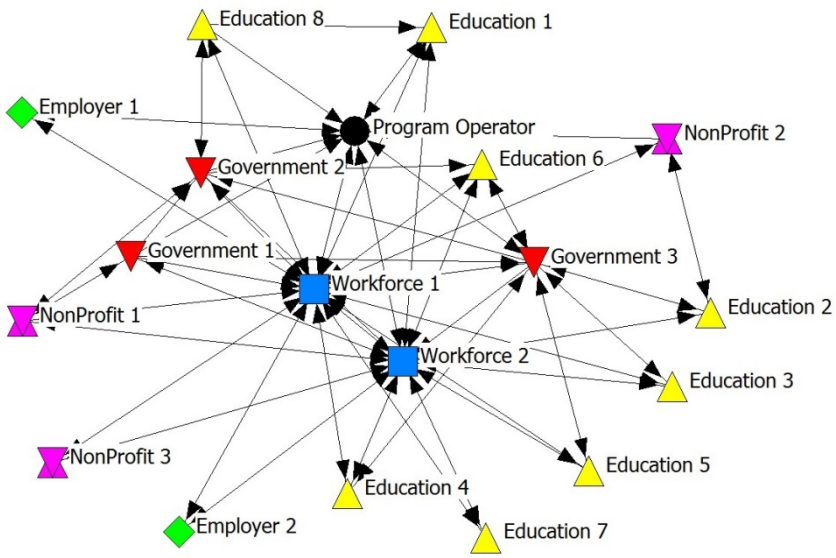


Exhibit E.10: Illustration of Improved Network Cohesion

This sociogram shows a medium-sized network where many network members found each other helpful; the many bi-directional arrows indicate that there were many cases of organizations being mutually beneficial to each other.

Before HPOG Grant:



Three Years Later:

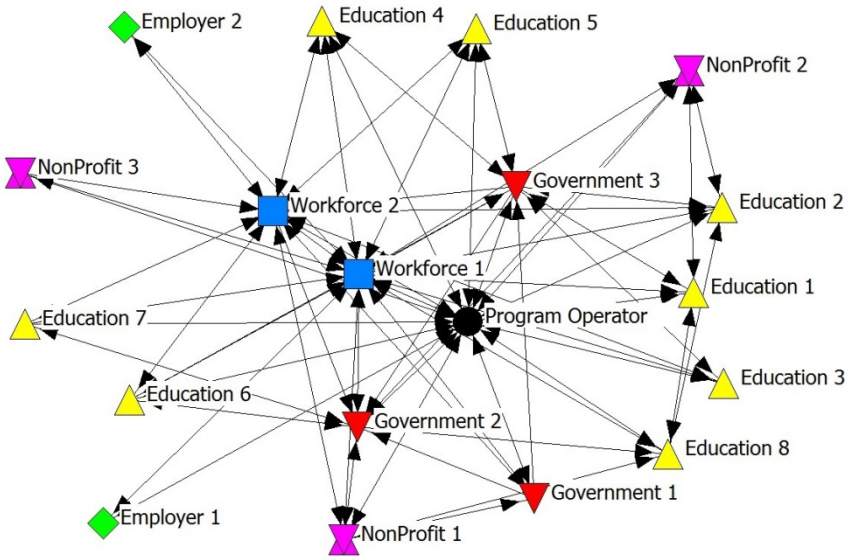
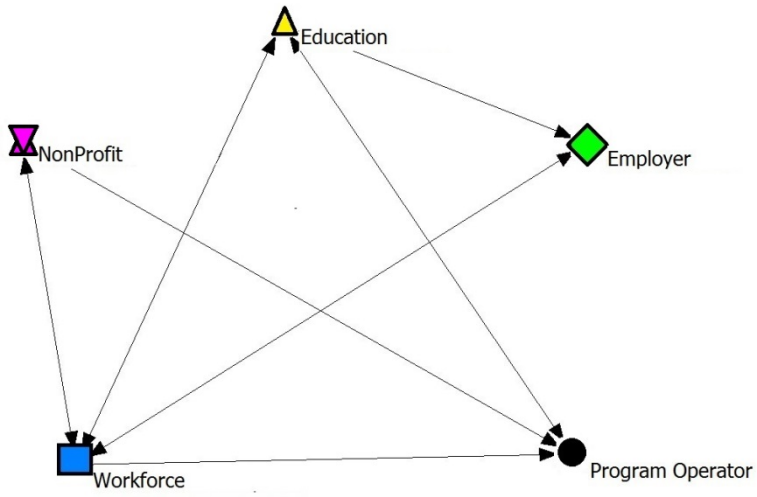


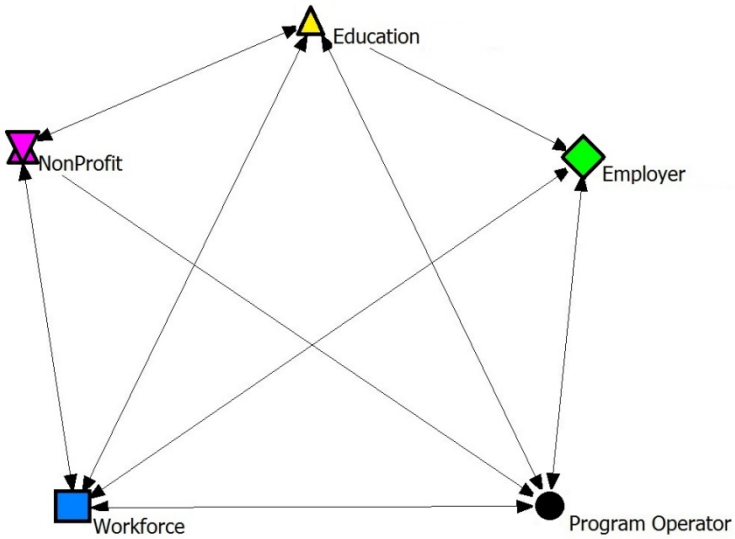
Exhibit E.11: Illustration of Improved Cross-Type Density

This sociogram shows a small network where nearly all the different organizational *types*—educational/training institutions, business sector organizations, workforce development agencies, and non-profit organizations—were connecting to each other, and to the program operator, after the HPOG grant. Here the nodes in the network are not individual organizations but groups of organizations of a given type.

Before HPOG Grant:



Three Years Later:



Appendix E: Systems Change Analysis Research Questions

The major research questions addressed in the Systems Change Analysis were broken down into a number of sub-questions as follows:[15]

Local economic and healthcare labor market context

What is the local economic and healthcare labor market context as HPOG was being implemented and did it change during HPOG? To what extent did HPOG train workers for high-demand occupations?

The HPOG Program provided funds to institutions and organizations to create programs that prepare participants for healthcare jobs that pay well and are in high demand. These research questions are aimed at describing the local job market (e.g., unemployment rates) and more specific healthcare labor market characteristics in HPOG program locales (e.g., healthcare employment types, levels, and changes) as context for understanding the systems changes made as the HPOG programs were implemented. This question also addresses whether HPOG programs are supplying workers to the local healthcare industry in the occupations employers describe as being in high demand and difficult to fill and the level of employer satisfaction with these workers and the HPOG programs.

Local healthcare training opportunities

What local healthcare industry training opportunities for low-income populations existed prior to HPOG? Did they expand or change under HPOG?

This question is intended to describe the nature and extent of healthcare industry training before and after the introduction of the HPOG Program. The study describes whether the HPOG programs expanded the suite of healthcare education and training offerings. It also assesses the degree to which HPOG programs improved access to training and likelihood of success in completing training for targeted populations based on the perspectives of the HPOG network members, including the program operators.

Boundaries, relationships, and stakeholder perspectives of HPOG system

What are the boundaries, relationships, and stakeholder perspectives of the HPOG system? How did each grantee configure the "HPOG system" (e.g., the number and type of key partners, whether required partners were engaged)?

These questions address the importance of understanding the features of the system or network of partners. In addition to documenting who the partners and stakeholders were, the study conducted an analysis of their roles and responsibilities and the extent to which they were active in the HPOG programs and represented new versus ongoing relationships. The study addresses how collaborative structure varied across HPOG programs.

Changes to internal structures and procedures

What changes to internal structures and procedures were made when implementing HPOG within lead agencies and within partner agencies? To what extent do partners and stakeholders perceive that changes necessary to the HPOG mission were accomplished?

This set of questions focuses on organizational elements that are facilitators—or conversely, barriers—to system-level reforms. They provide the context for understanding the initiative's success or failure to achieve its goals.

Changes in communication, coordination, and collaboration across systems

What changes were made in communication, coordination, and collaboration across systems (i.e., postsecondary educational institutions, workforce development agencies, social services agencies, and healthcare employers) when implementing HPOG? To what extent do partners and stakeholders perceive that changes necessary to the HPOG mission were accomplished?

This set of questions focuses on the necessity of coordinating activities across providers and institutional domains. In addition to capturing information about the types and number of organizational entities included in the sharing process, these questions also focus on changes in the nature and quality of interaction among the network members.

Changes to service delivery systems

What changes occurred in partner institutions with respect to articulation of healthcare career ladders, market-driven education and training programs, support services, and pre-training/basic skills instruction? What factors, if any, hampered systems change?

These questions emphasize system-level results in terms of changes in the context of important goals of the HPOG Program: 1) generating more market-driven healthcare education and training, 2) increasing the supply of trained healthcare workers (i.e., the intermediate outcome), and 3) contributing to improvements in healthcare provision (i.e., the long-term outcome). The analysis captures how network members viewed the changes to education and training systems as a result of the HPOG program. It also examines the positive and negative events external to the HPOG programs that may have affected their success.

Potential for sustainability of systems changes after the grants

Are changes in policy and practice introduced into the lead agency and its partners retained after the HPOG demonstration? Are interactions (communication, coordination, and collaboration) among network actors and organizations established under HPOG retained and leveraged?

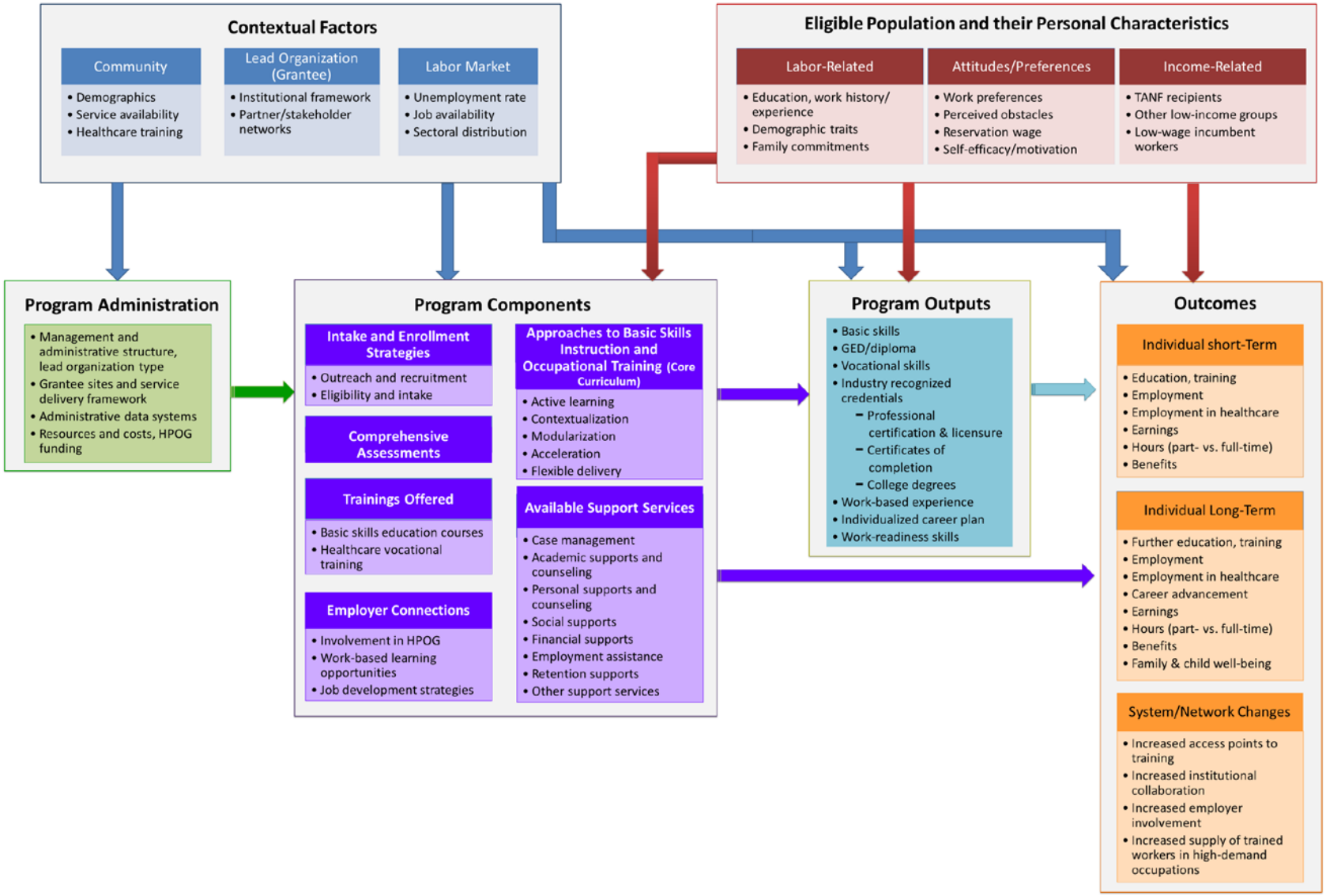
These questions address whether, and to what extent, systemic changes occasioned by the HPOG Program, with its visibility and federal funding, could potentially become standard operating principles and procedures once the HPOG Program ends.

Lead agency, partners', and stakeholders' satisfaction

What are the nature and extent of lead agency, partners', and stakeholders' satisfaction? What are their views regarding the effectiveness of HPOG in meeting its goals? Did employer perspectives on low-income workers change as a result of HPOG?

These questions address performance quality—not just what activities and products resulted, but whether the HPOG programs met the needs of organizations in the networks, TANF recipients and other low-income individuals who were expected to benefit from the program, and healthcare employers. Service quality is an important consideration, as failure to implement programs that meet customer needs can undermine the success of the overall initiative. For example, if networks develop and offer new market-driven healthcare curricula, but targeted populations do not enroll or are not retained through graduation, certification, or licensing milestones because the education/training is too expensive, is offered at inconvenient times or places, is lacking in cultural competence, or is of low quality in other respects, the initiative likely will not achieve its intended results and may not be durable.

Appendix F. HPOG Logic Model



Appendix G: Definitions of HPOG Partner and Stakeholder Roles

Organizations could serve many different roles as a part of the HPOG programs, which integrated a wide range of activities and services in order to engage and support the success of participants. The Stakeholder/Network survey asked respondents about their involvement in 11 different activities. The analysis grouped roles into the following five categories:

Referral and outreach

- *Referral of applicants for services provided by the program operator institutions* – this activity includes formal referral arrangement, initial screening of applicants, and referral of current employees.
- *Marketing and outreach* – a program's efforts and activities to encourage the program's target population to apply for and use the program's services. This activity includes printed materials available on-site, information available on partner's website, mentions during presentations to stakeholders, mentions during orientation for organization's services, and mentions during assessment and counseling sessions.

Training

- *Curriculum development* – this includes offering examples of relevant curricula, providing feedback on draft curricula, and writing modules for curricula.
- *Vocational or occupational training* – defined as an activity aimed at enabling participants to attain the required level of knowledge and skills to successfully perform the responsibilities of a job. This includes operation of a training program, provision of faculty/instructors, provision of training space, provision of equipment, provision of learning technologies, and provision of work-based learning opportunities (i.e., internships or clinicals).
- *Pre-training activities*, defined as specific types of components in which individuals participate to prepare them for vocational/occupational training. These include: prior to training, provision of workshops on healthcare occupations and educational requirements; reading or math refresher courses; computer skills; and/or provision of pre-training faculty/instructors, training space, equipment, and/or learning technologies. Pre-training activities might also include assessment of supportive services needs and a plan for providing those services (e.g., child care, transportation).
- *Basic academic skills education* – includes education for foundational math, reading, and writing skills, such as General Equivalency Degree (GED) classes, pre-GED Classes, English as a Second Language (ESL) instruction, and adult basic education. In addition, it includes learning skills and study skills, both of which are necessary for students to succeed at the college level.

Employment assistance

- *Job development activities* – includes job readiness workshops, job search skills training, individual job search assistance, job coach navigator support, group job search support, and post-placement and retention support.

- *Job placement activities* – defined as activities that support and assist an individual in looking for an appropriate job. Job search/placement assistance may include help in resume preparation, identifying appropriate job opportunities, developing interview skills, and making contacts with companies on behalf of eligible individuals, as well as referrals of individuals to jobs matching their abilities and interests. Services can be offered on an "individualized," one-on-one basis, or in the context of a group, commonly referred to as "job clubs." This role includes obtaining and screening job listings for HPOG participants, screening HPOG participants for suitability for a position, scheduling interviews for a job candidate, and providing interview space.
- *Recruitment or hiring of HPOG graduates* – includes guaranteeing interviews for successful graduates or soon-to-be graduates, placing job listings with the HPOG program, and placing direct call(s) to the HPOG program manager or other contacts to learn about potential candidates.

Counseling and support services, where *counseling* is defined as professional guidance or advice given to individuals or to groups of individuals for a particular purpose and *support services* include a range of services families or individuals need to be successful in school or work. These activities include academic supports and social supports, including counseling, personal supports, and financial supports.

Planning and design of HPOG grant activities – where *planning and design* are defined as involvement in the pre-implementation of HPOG programming. This includes involvement in grant writing, writing letters of commitment, and serving as a member of an advisory/steering committee.

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[1] Program operator type was based on categories assigned in Theresa Anderson, Pamela Loprest, Teresa Derrick-Mills, Lauren Eyster, Elaine Morley, and Alan Werner, *Health Profession Opportunity Grants Year Two Annual Report (2011–2012)* (OPRE Report # 2014-03) (Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2014). http://www.acf.hhs.gov/sites/default/files/opre/hpog_second_annual_report.pdf.
This report classified operator organizations into postsecondary educational institutions, Workforce Investment Boards, state or local government agencies, and community-based organizations. One program operator, a healthcare employer, did not fall neatly into one of these four categories; it was included with the non-profit organizations because it was a non-profit employer.
[2] Source: HPOG Grantee survey, 2014, Q3.1.
[3] See Katherine Faust, "Comparing Social Networks: Size, Density, and Local structure," *Advances in Methodology and Statistics* 3, no. 2 (2006): 185–216. http://mrvar.fdv.uni-lj.si/pub/mz/mz3.1/faust.pdf; Robert A. Hanneman and Mark Riddle, *Introduction to Social Network Methods*, Chapter 7: Connections and Distance (Riverside: University of California, Riverside, 2005). http://faculty.ucr.edu/~hanneman/nettext/C7_Connection.html; and Mohsen Jamali and Hassan Abolhassani, *Different Aspects of Social Network Analysis*, IEEE/WIC/ACM International Conference (2006). https://www.cs.sfu.ca/~oschulte/teaching/socialnetwork/papers/SNA-intro-mohsen.pdf.
[4] Jennifer Yahner and Jeffrey A. Butts, *Agency Relations: Social Network Dynamics and the RWJF Reclaiming Futures Initiative (A Reclaiming Futures National Evaluation Report)* (Portland, OR: Reclaiming Futures National Program Office, Portland State University, 2007).
[5] In calculating proximity, outliers are assigned a distance equal to N (the size of the network) from every other organization. This is one greater than the maximum distance between two nodes, which is N-1.

[6] John K. Roman, Jeffrey A. Butts, and Caterina Gouvis Roman, "Evaluative systems change in a juvenile justice reform initiative," *Children and Youth Services Review* 33, no. 1 (2011): S41-S53.
[7] See David Knoke and Song Yang, *Social Network Analysis, 2nd edition* (Thousand Oaks, CA: Sage Publications, 2007).
[8] Stephen Borgatti, Martin Everett, and Lin Freeman, *Ucinet for Windows: Software for Social Network Analysis* (Harvard, MA: Analytic Technologies, 2002). https://sites.google.com/site/ucinetsoftware/home.
[9] Netdraw is embedded in the Ucinet software program.
[10] Helpful ties, as defined previously, were regularly occurring interactions perceived as helpful to an organization's goals.
[11] For 38 of the 49 program operators, network size and network analysis size were identical. For almost all others, network analysis size was between 70 and 99 percent of network size.
[12] Gueorgi Kossinets, "Effects of missing data in social networks," *Social Networks* 28 (2006): 247-268.
[13] Mark Huisman, "Imputation of missing network data: Some simple procedures," *Journal of Social Structure* 10, no. 1 (2009): 1-29.
[14] Garry Robins, Philippa Pattison, and Jodie Woolcock, "Missing data in networks: exponential random graph (p*) models for networks with non-respondents," *Social Networks* 26, no. 3 (2004): 257-283.
[15] See Alan Werner, Robin Koralek, Ann Collins, Glen Schneider, Pamela Loprest, Shelli Rossman, and Lauren Eyster, *Design Report: National Implementation Evaluation of the Health Profession Opportunity Grants (HPOG) to Serve TANF Recipients and Other Low-Income Individuals* (OPRE Report # 2014-02) (Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2014.)