

Knowledge Management and Accountability in an Inter-Organizational HIV/AIDS Service Delivery Network

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DISSERTATION

Submitted as partial fulfillment for the degree of Doctor of Public Health
in the School of Public Health of the University of Illinois at Chicago, 2017
Chicago, Illinois

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ACKNOWLEDGEMENTS

I would like to acknowledge my Dissertation Committee- Louis Rowitz, Patrick Lenihan, Eve Pinsker, Bernard Turnock, and Christine Bevc- for their support, assistance and patience. Their guidance was invaluable in professional and personal areas that kept me focused, and encouraged me when needed. I would also like to acknowledge the University of Kentucky, National Coordinating Center for Public Health Services and Systems Research, for their support for this work through a doctoral grant.

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LIST OF ABBREVIATIONS
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ACA.....	Patient Protection and Affordable Care Act
ADAP	AIDS Drug Assistance Program
AICP	AIDS Insurance Continuation Program
ASO	AIDS Service Organization
BCC	Board of County Commissioners
BHPPC.....	Broward HIV Prevention Planning Committee
CBO.....	Community-Based Organization
CDC.....	Centers for Disease Control and Prevention
CIED	Centralized Intake and Eligibility Determination
CTS.....	Counseling and Testing Site
DL	Digital Language
EIIHA.....	Early Identification of Individuals with HIV/AIDS
EMA	Eligible Metropolitan Area
FQHC	Federally-Qualified Health Center
HAART	Highly-Active Anti- Retroviral Treatment
HAB.....	HIV/AIDS Bureau
HICP	Health Insurance Continuation Program
HIP	High Impact Prevention
HIV/AIDS.....	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HIVPC.....	HIV Planning Council
HPTN.....	HIV Prevention Trials Network
HOPWA.....	Housing Opportunities for People with AIDS
HRSA	Health Resources and Services Administration
IGR.....	Inter-Governmental Review
IOM.....	Institute of Medicine
IRB	Institutional Review Board
IT.....	Information Technology
LHD	Local Health Department
LPAP.....	Local Pharmacy Assistance Program
MAI	Minority AIDS Initiative

LIST OF ABBREVIATIONS (continued)

MAPP	Mobilizing for Action through Planning and Partnerships
MCM.....	Medical Case Management
NACCHO	National Association of City and County Health Officials
NHAS	National HIV/AIDS Strategy
NQC	National Quality Center
OAMC	Outpatient Ambulatory Medical Care
OIG	Office of the Inspector General
ONAP	Office of National AIDS Policy
P&A.....	Priorities and Allocations Process
PCMH.....	Patient-Centered Medical Home
PE.....	Provide Enterprise
PHSSR	Public Health Systems and Services Research
PLWHA.....	People Living with HIV/AIDS
PMN.....	Public Management Network
QI.....	Quality Improvement
QM.....	Quality Management
QMC	Quality Management Committee
REACH.....	Racial and Ethnic Approaches to Community Health
RWJF	Robert Wood Johnson Foundation
SCSN	Statewide Coordinated Statement of Need
SDM.....	Service Delivery Model
SNA.....	Social Network Analysis
SOC	System of Care

SUMMARY

An exploratory social network study of an HIV/AIDS system of care in Broward County, Florida. This was a mixed-method study that utilized relational and attribute data to examine the structural characteristics of a clinical service delivery network. Key stakeholder interviews, field observations, and a social network survey were utilized to collect data related to relationships between organizations in the local public health system. Best practices were identified related to knowledge management across an interorganizational network. Relationships between organizations were described in terms of accountability processes inherent in interorganizational relations. The research addressed the central role of a local governmental health department in differing relations of interest, and identified best practices in the use of data for network-level knowledge management.

The availability of client-level clinical and administrative data is a crucial factor in the ability of local public health systems to effectively use data in knowledge management activities. The use of such a data portfolio is a best practice in comprehensive community planning and establishing accountability between organizations in local systems of care. Management of relationships in the interorganizational system is distributed across local actors. Organizations are constrained in their ability to engage political stakeholders based on the diversity of unrestricted funding streams.

Chapter I. Introduction

Responding to contemporary public health crises requires leaders that have an ability to coordinate collective action from the many organizations that comprise the public health system. This involves nonprofit health and social service agencies, three levels of government, private sector organizations, educational institutions, and others. In implementing public health interventions, leaders are challenged to demonstrate that the public investment in these efforts are effective. As challenging as this is within individual organizations, public health interventions require that participating organizations are mutually accountable to each other, as well as to external stakeholders in the authorizing environment. Accountability in public sector work can take several forms, including accountability through contractual vehicles, reporting relationships as a condition of funding through federal and state grantmaking, informal accountability to local partners, or mutual accountability of the public health system to achieve some specific health outcome. The public health leader, therefore, must be prepared to act within and through interorganizational networks to achieve desired outcomes. Demonstrating accountability is both an evaluative and a governance process, and these processes require robust information systems that support local interventions, process improvements, and communicating results. Since public health systems involve interorganizational networks, a network-level system of knowledge management is a requirement to assure a highly-functioning, effective endeavor.

Public health as a system of coordinated public services is rarely understood by the public. Health systems in the United States are complex networks of public, nonprofit and private organizations that coalesce and self-organize around emerging threats, new opportunities, and through public and private mandates. These systems of organizations, or interorganizational networks, are required to communicate information across organizational boundaries to support coordinated action that improves population health. The capacity to accumulate, organize, and analyze data and information across inter-

organizational networks represents a key component of public health infrastructure, and a challenge to leaders whose actions are limited by organizational boundaries. The collective use of this information to assure mutual accountability for results represents a key challenge for leaders in public health practice.

Governance and accountability are two distinct, yet related, social processes that establish the rules and practices by which organizations interact and behave within public health systems. These processes shape the patterns of interaction between public sector organizations, which have in turn influenced the development of public health practice in the United States. Governance refers to “structures and processes that are designed to assure accountability, transparency, responsiveness, rule of law, stability, equity and inclusiveness, empowerment and broad-based participation...governance is about the cultural and institutional environment in which citizens and stakeholders interact among themselves and participate in public affairs. Governance is about how power is distributed and shared, how policies are formulated, priorities set and stakeholders made accountable” (UNESCO, 2017). Accountability refers to the process by which local public health systems verify performance to external stakeholders or authorizing entities, and by which organizations in a public health network are responsible to each other for implementing purposive action. For public health systems, accountability can take the form of reporting on activities legally mandated by statute, verifying compliance to external funders, or demonstrating improvements in population health status indicators to community stakeholders. From a governance perspective, processes of public health system accountability can be program specific, agency specific, or system-wide. Accountability in the context of public health, more significantly, refers to shared responsibility for community-level health outcomes across multiple system actors. In this paper, the term “mutual accountability,” implies both formal and informal relational mechanisms that assures that multiple organizations are held accountable for outcomes in the local public health system. This also involves formal reporting requirements between local agencies, as well as between local lead agencies and federal funders. While public sector performance management

became popular in various mid-1990s “good government” initiatives, its application to public health is unique in that it relates more specifically to establishing a correlation between the activities of public health organizations and the health status of populations. Linking investment in public health programs and infrastructure to improvements in population health is difficult due to the dynamic nature of the population’s health, as well as the complex relational structure of social institutions charged with implementing public health programs and providing essential public health services. In governmental public health systems, advancements towards a national system of voluntary agency accreditation have provided a set of metrics related to local governmental public health agency and system performance. However, the mechanisms that tie these measures to community-level health outcomes are less clear. Demands for accountability for health outcomes represent a key driver of change in public health practice, but this comes with the realization that health problems manifested at the level of population are the result of dynamically interacting factors, many of which lie beyond the control of a single organization to address. Interventions to improve population health typically require multiple points of action with coordination across networks of public health service providers, who may also periodically have competing interests. The Institute of Medicine (2011) described “mutual accountability” in public health systems where, “stakeholders must assume both an oversight role and an implementation role. The group (coalition, alliance, board or other structure) holds individual organizations accountable for performance through public reporting and other agreed on mechanisms, such as incentives for future leadership roles and funding.” Accountability for improving the population's health is therefore shared by multiple public health organizations.

Accountability for health outcomes within interorganizational health systems requires an understanding of shared responsibility for assuring efficient service delivery and subsequent health outcomes. The financing and delivery of public health services is often based on a specific disease or episodic crisis, and financed by a combination of local, state and federal funding sources. Specific

constituencies and stakeholders may support or oppose specific strategies or funding priorities within the broader public health system. In this study, an HIV/AIDS system of care was investigated as an example of how public health networks sustain information exchange to establish mutual accountability for health outcomes. To understand how the rules of interorganizational (mutual) accountability influence information system practices, this study analyzes a specific case within a specific public health context. This, in turn, provides insights into the applicability and relevance of a general conceptual model that ties accountability for health outcomes to the information system practices of a public health network.

To understand the context of contemporary public health information systems, it is useful to consider the recent history of performance management in the United States, both in governmental public health and HIV/AIDS systems of care. The Institute of Medicine (IOM) first reported in 1988 in *The Future of the Public's Health* that the public health system was in disarray. This finding came at a time in which the HIV/AIDS epidemic was on an upward trajectory in the United States. It was out of necessity that the gay community, as an outgrowth of the gay rights movement, provided the leadership necessary to create an initial response to the AIDS epidemic. During the time of Reagan's "New Federalism," when responsibility for many social health and welfare programs were devolved to state and local governments, many state and local public health systems were unprepared to deal with the crisis. Thus, HIV/AIDS systems of care emerged alongside existing governmental-oriented public health systems. Diseases sometimes appear and spread by non-random processes, following paths of least resistance. These paths are paved by poverty, social conditions, individual behavior, and environmental factors. In the case of HIV/AIDS, the disease became established and first took root in San Francisco and New York, and later spread to other urban jurisdictions such as south Florida. Broward and Dade counties in Florida currently have the highest incidence of new HIV infection in the United States. The system of care for HIV/AIDS in Broward County demonstrates how an engaged public health system uses

data and information to drive decision-making, addresses local needs, and assures that the organizations serving people living with HIV/AIDS (PLWHA) are accountable to the community they serve.

This research demonstrated how local HIV/AIDS systems of care adapt to changes in federal programs, and retain a resilience to respond to changes in disease etiology, financing structures, and public policy at multiple levels of government. This story is, in part, a story of two different approaches to public health practice, two federal public health systems that evolved in parallel. On one hand, the HIV/AIDS system of care grew out of the grassroots organizing of the gay rights movement in general, and specifically the direct-action initiatives of gay activists in the late 1980s/early 1990s which demanded care from what they viewed was an unresponsive public health establishment. During the same period, the governmental public health system was implementing the Performance Management National Excellence Collaborative, a set of initiatives supported by the Centers for Disease Control and Prevention (CDC), the Robert Wood Johnson Foundation (RWJ), and state and local governmental public health agencies. This illustrates the co-evolution of two distinct public health systems, which over time became integrated. This occurred as HIV-specific systems of care grew out of networks of AIDS Services Organizations (ASO) that were separated from the governmental health agencies. These networks were started by AIDS activists to care for the dying at a time when the public health establishment was slow to respond to the epidemic due to stigma and discrimination. The HIV system, evolving on a parallel track, developed systems of accountability, data use, and performance frameworks simultaneous to efforts of RWJ, CDC, and others to create the Performance Excellence Collaboratives. The evolution of the early ASO networks involved the eventual integration with governmental public health. For HIV-specific public health networks, there is an interesting amalgamation of the two strands within an increasingly integrated network. The research presented

here demonstrates how the data use practices of the HIV/AIDS system of care might inform the continued effort to develop systems and accountability processes across public health practice contexts.

Study Objectives

The purpose of this applied research study was to examine how public health networks function as information systems to facilitate the exchange of data and information to establish mutual accountability for health outcomes. The research utilized a mixed-methods study design by combining a qualitative case study of a local HIV/AIDS System of Care (SOC) with a quantitative social network analysis of an interorganizational network of prevention and patient care service providers. Through social network analysis, the structure and patterns of relationships between organizations was investigated to identify the information exchange relationships and organizing factors that influenced how accountability for population-level health outcomes was established, measured and communicated. In order to develop an understanding of the relationship between information exchange and accountability, three general areas of inquiry were addressed in this research: (1) the influence of change in the federal intergovernmental system in shaping local public health system information system practices; (2) the evolution of network structure as public health systems adapted to change, and (3) the practices of network-level data and information exchange utilized to support public health programs and document program outcomes. These general areas of inquiry were addressed by examining a specific public health practice context: the HIV/AIDS system of care. The role of data and information exchange in assuring accountability for health outcomes represents a link between IT infrastructure, data management practices, and the health outcomes associated with public health programs. A secondary focus of this study examined the evolving role of the local health department as a central actor within two distinct program areas in HIV/AIDS: HIV prevention, and HIV patient care. The evolution of the role of the local governmental public health agency illustrated how central actors

respond to changes in the external environment, and how they can act as facilitators of integration between public health and primary care systems.

Background and Context

Checkland and Holwell (1998) in their work *Information, Systems and Information Systems* presented a systems model in which the learning organization transforms data into information, and through the process of feedback, supports the purposive action of the organization to achieve its strategic objectives. The authors made a clear distinction between information technology (the physical hardware and software) and information systems. In public health systems, the physical information technology (IT) represents a key component of public health infrastructure, but the larger “information system” represents the exchange practices of information to support the goals of the public health enterprise. While the physical technology tends to receive more attention, the information system emphasizes understanding the purposive action of the system, the process of applying shared meaning to information for purposeful action, and the role of IT in supporting purposeful activity. This implies that in addition to the technological aspects of data and information exchange, knowledge management often takes place in a multi-stakeholder, networked environment

Public health informatics has been defined as, “the application of computer science and technology to public health practice, research, and learning” (O’Carroll, et al, 2003). Recognizing the governmental context in which public health is practiced, the authors identified informatics challenges: the need to obtain data from multiple sources; the need to aggregate and combine data from these sources; analyzing and presenting data in ways that are compelling to policy makers; and the need for practitioners to maintain confidentiality of individual’s health information. Much emphasis in the field of public health informatics has been on the technical design of surveillance systems, and the transfer of health data across system actors. While many local governmental public health agencies have scaled

back their involvement in direct clinical services, the development of health information exchanges is one example illustrating a potential source of clinical data for public health use. As demonstrated in Health Services Research, the ability to tie service utilization and service expenditure data to client-level and population health outcomes is predicated on the availability of robust information systems, and in the information sharing and management practices around health data.

While “the public health system” is sometimes referred to as a singular system, public health practice is organized around the constitutional structure of state governments, as well as directly between federal agencies and the nonprofit sector. At the federal, state, and local levels public health systems are comprised of multiple actors representing governmental, nonprofit, public and business sectors. The role of the governmental public health organization thus varies depending on the programmatic context. When studying public health systems at the local level, the organization acting as the “lead” agency can change depending on the requirements of the program funder, and may involve governmental or non-governmental actors. Systems change, driven by external forces such as implementation of new federal programs, may also result in a change in relationship patterns among the organizations comprising the local public health system. As outlined in a report of the Institute of Medicine, *For the Public's Health: The Role of Measurement in Action and Accountability*, integration of public health and medical care organizations is increasingly encouraged in the context of mutual accountability for population health outcomes. Integration is also addressed through coordinated efforts to implement evidence based practices (e.g. clinical and community preventive services), and to link the targeting of these services through processes of community health planning. Implicit in mutual accountability for population health outcomes are the information systems that serve as the critical infrastructure to support these processes. Health system integration is thus linked to the domain of information systems. Information technology is understood as one component of an information system that supports system-level learning across interorganizational networks.

One area of public health practice that illustrates an advanced stage of system-level IT infrastructure and information system practices is the Ryan White program for HIV/AIDS treatment. Across fifty state jurisdictions and fifty-two urban jurisdictions, the Health Resources and Services Administration (HRSA) has provided funding for the treatment of HIV/AIDS since 1990. Since the inception of this program, providers of clinical care and state and local prevention programs (typically funded by the Centers for Disease Control and Prevention (CDC) and state governments) have collaborated in joint planning activities. These efforts have resulted in over twenty years of information sharing practices at the local level, and between levels in the intergovernmental system.

The Ryan White program has specific information-exchange components and processes that make it a useful case study for examining how information systems (in Checkland's model) utilize clinical data in demonstrating health system performance and mutual accountability for health outcomes at the level of the interorganizational network. In the Ryan White Part A program, 52 urban jurisdictions receive direct federal funding for treatment and support services for people living with HIV/AIDS (PLWHA). Each Part A jurisdiction (Eligible Metropolitan Area, EMA) is required to have a local planning council appointed by the Chief Executive (usually the County or City Executive). Planning Councils are responsible for approving funding allocations across core medical and support service categories. The County Executive also designates an organization/agency (Grantee) to administer the program and to contract with providers of medical care and support services. In Florida, local Part A Grantees are designated by the County Executive (Board of County Commissioners), so the Part A Grantees are agencies of County government. The Ryan White Part B program, which includes the AIDS Drug Assistance Program (ADAP), is administered through the Florida Department of Health (FDOH), in partnership with local offices of the State health department. Therefore, Part B programs are managed as a state program, and Part A programs are managed by County government. The distinction in roles between the state health department system (Ryan White Part B), and the 6 EMAs in Florida (County government) presents

interesting challenges in coordination of services across both Parts of the Ryan White program. Mutual accountability frequently involves dialogue and service coordination between units of government that occasionally operate under different sets of political constraints, or have competing priorities. In conclusion, the Ryan White Part A program is administered by HRSA's Bureau of Metropolitan HIV/AIDS programs, and funds EMAs to provide medical and support services within a local system of care. Funds are received by the local County Executive to an agency of County government to act as the Grantee. The Grantee has responsibility for disbursing funds and maintaining overall compliance with program requirements across the system of care. Contracted sub-recipients provide medical and support services to PLWHA in the jurisdiction, and are responsible for assuring quality services and reporting health outcomes to the Grantee and local planning council. Local planning councils are appointed by the local County Executive, and have the responsibility to approve service category allocations. The Grantee, in turn, is responsible for contracting allocated funds through a Request for Proposals (RFP) process, and funds agencies that comprise the local system of care.

Planning Councils are required to be comprised of at least 33% of people living with the disease (Persons Living with HIV/AIDS, PLWHA), and this representation must also reflect the demographic composition of the epidemic in the jurisdiction. Because of this, consumers of HIV services play a vital role in making funding and policy decisions. For example, local planning councils are required to approve overall allocations across core medical and support service categories. Provider agencies (also represented on local planning councils) that have an interest in an allocation decision are required to abstain from voting on the issue. This gives non-aligned consumer representatives a greater proportional weight to their votes on allocation decisions. This practice was codified in the original legislation, and was an outgrowth of the AIDS activism in the 1980s that led to the passage of the Ryan White Care Act. Thus, non-aligned consumers are active in local policy and planning discussions, and serve as a key link in the overall system of interorganizational accountability.

There are two key processes in the Ryan White program where fiscal, utilization, and health outcome data are used to make decisions concerning funding allocations. The first is the Priorities and Allocations (P&A) process, which is outlined in the Ryan White Part A Manual. This typically involves a review of the fiscal performance of individual Ryan White contracted agencies, as well as trends in the utilization of Ryan White services and their associated health outcomes. It is not uncommon for planning councils and Grantees to review utilization and spending ratio data (cost/client, unit cost) when evaluating service delivery or comparing agency performance. Service utilization analysis also plays an important role in the P&A process, where past trends in service utilization and future predicted trends are considered in allocation decisions.

A second key process that links data/information exchange with accountability for health outcomes are the Quality Management (QM) programs mandated by HRSA in Ryan White programs. Each Part A Grantee is permitted up to 5% of the total grant award to fund a QM program. These programs are also supported by the HRSA-funded National Quality Center, which is based out of the New York State Department of Health. The QM infrastructure nationally and within local EMAs provide the context for analyzing the health trends in Ryan White populations. Current practice in HIV prevention and treatment focuses on measures of viral load suppression and retention in care. These outcome measures are typically measured by subpopulation, treatment provider, or service category. The HIV Treatment Cascade is a model that measures each step in the HIV care continuum. These include: (1) total population of HIV+ PLWHA; (2) total diagnosed; (3) total linked to care; (4) total retained in care; (5) total prescribed Anti-Retroviral Therapy (ART); and (6) total virally suppressed (see Figure 10). The ultimate health outcome goal for EMAs is to increase the rate of viral suppression in the community, thus decreasing the amount of new infection.

Quality Management programs and P&A processes share the need to utilize fiscal, utilization, and clinical health data to improve quality of services, reduce costs, and improve outcome measures

across the HIV Treatment Cascade. This however, is not done in a vacuum. The National HIV/AIDS Strategy (NHAS) is a federal initiative from the Office of National AIDS Policy that coordinates HIV treatment and prevention programs at the federal level through three over-arching goals: reduction of new infections, decreasing health disparities, and increasing access to care. The HIV Treatment Cascade (also referred to as the Care Continuum) provides a framework for the measurement and documentation of the health status of local EMAs and other HIV programs (such as CDC-funded HIV prevention programs). This model, coordinated through the NHAS, provides a framework for consistently measuring health outcomes in a jurisdiction. Local EMAs can then evaluate the performance of agencies, health outcomes of vulnerable sub-populations, and cost/availability of services in a consistent and methodologically sound manner. This provides an example of how clinical data is used to hold Grantees and funded agencies accountable to planning councils, and planning councils accountable to local communities and federal funders.

A final component of Ryan White programs that support them as a case worthy of study involves the data management systems used to store and exchange clinical data. Typically, Grantees will pay for a network-level data management system with Ryan White administrative funds (capped at 10% of the grant award). There are a variety of proprietary and public data management systems in use, but they all share several common characteristics. These systems typically house clinical and support services data on a central server, which can be externally-hosted or maintained by the Grantee. Part A service providers enter or electronically-transmit data to the central server. This involves either a direct data exchange of clinical data from an Electronic Health Records (EHR) system, or manually entering data for support services. Client-level data can usually be accessed by any agency that provides services to the client, and the Grantee has administrative rights over the data of the entire client population. These systems usually have a process for establishing eligibility for services (with income and residency criteria). Some systems also have the capability of generating reimbursement requests for agencies to

submit invoices for payment. The Grantee, who has responsibility for reporting requirements to HRSA, accesses the population data base to submit required reports, such as the Ryan White Services Report (RSR), among others. The Ryan White program provides a unique example of integrated clinical data management systems, information system practices, and a health outcomes framework that illustrate how data and information is exchanged across an interorganizational network to support purposive action (increasing viral suppression), and mechanisms of accountability for achieving specific health outcomes.

This research project focused on a single, exemplar case: The Broward County, Florida Ryan White Program Eligible Metropolitan Area (EMA). The network was comprised of agencies that provided HIV treatment services (Ryan White Parts A and B), as well as HIV prevention services (funded by the Centers for Disease Control and Prevention, CDC). On the patient care side, the Ryan White Part A program was administered by the Broward County Department of Human Services (BCHS, the Grantee of Part A funds). BCHS in turn issued contracts to local service providers after service category allocations were approved by the local planning council. Local Part A service providers included:

- *Broward Regional Health Planning Council*: Centralized Intake and Eligibility Determination, Quality Management, Planning Council Support.
- *Florida Department of Health in Broward County* (local health department): Oral Health, Pharmacy
- *Care Resource, Inc*: a long-serving local AIDS Service Organization and a Federally Qualified Community Health Center (FQHC): Non-Medical Case Management, Outpatient Ambulatory Medical Care, Mental Health, Legal Services
- *Broward Health North*: a taxpayer-supported public hospital district representing north Broward County: Outpatient Ambulatory Medical Care, Pharmacy, Non-medical Case Management, Medical Case Management.

- *AIDS Healthcare Foundation (AHF)*, an ASO that provides services globally, which is headquartered in Los Angeles, CA: Outpatient Ambulatory Medical Care, Pharmacy, Non-medical Case Management, Medical Case Management.
- *Broward Community and Family Health Centers*, an FQHC: Outpatient Ambulatory Medical Care, Non-medical Case Management, Medical Case Management.
- *Broward House*, a long-standing local ASO: Mental Health, Substance Abuse, Non-medical Case Management.
- *Legal Aid Services of Broward County*: Legal Services
- *Memorial Healthcare System*: a taxpayer-funded public hospital district representing south Broward County: Outpatient Ambulatory Medical Care, Mental Health, Substance Abuse, Medical Case Management, Non-medical Case Management.
- *Nova Southeastern University*: Oral Health
- *Povarello Center*: Food Bank
- *City of Fort Lauderdale, Department of Housing and Community Development*, Housing Opportunities for People with AIDS (HOPWA) program

Funding for HIV treatment services in the local jurisdiction originated primarily through the Health Resources and Services Administration. Ryan White Part A funding (described above) was awarded directly to the County, while Part B funding was managed by the Florida Department of Health's (FDOH) central office in Tallahassee, and disbursed to local Part B Consortiums, which were managed by local offices of FDOH. In addition to being the lead agency for Part B funds, the FDOH in Broward County also received funds directly from CDC under that agency's High Impact Prevention (HIP) program. Broward was one two counties to receive HIP funding directly (even though the recipient agency is an office of State government). FDOH in Broward County in turn contracted HIP funding to

local organizations for HIV testing initiatives. As newly-infected persons were identified, referrals were made to Part A providers for HIV treatment services. FDOH in Broward County served in a critical linkage role between patient care and prevention in HIV care. One focus of this study was the pattern of relational ties across organizations that provided treatment services vs. those that provided prevention services. This was important to understand how integration between patient care and prevention programs influenced information sharing and planning processes.

Problem Statement and Study Questions

Addressing mortality and morbidity at the population level is complex. With multiple social, environmental, and political causative factors, the ability to address a public health problem is seldom under the control of a single organizational entity. Thus, actions of a public health system typically involve the coordinated action of multiple organizations. The problem for public health leaders involves the need to employ leadership strategies where there is often only indirect control over the actions of partner organizations, rather than the command and control management methods commonly employed within organizations. Leadership across interorganizational networks requires a fundamentally different skill set, sometimes referred to as *strategic network management* (Varda, 2011). Public health systems are also increasingly expected to demonstrate improvements in population-level health outcomes where responsibility for those outcomes are distributed across agencies and funding sources. This implies a coordination of information systems across the inter-organizational network to support the ability of local networks to measure health outcomes. Mutual accountability for health outcomes is therefore both a leadership challenge and an information system challenge. This research provides insight into effective practices to support the demands for accountability in a complexity environment.

The use of data and information to establish mutual accountability for health outcomes takes place within the context of interorganizational networks. The structure of the network also influences how information is shared, and how public health interventions are implemented. In this study, network structure referred to the relational patterns across agencies in the public health system. For example, an agency that serves as the recipient of federal funds, and in turn subcontracts funds to other agencies within the system to provide direct services, will play a prominent role in the local network. This can be quantified in terms of the centrality measure. The centrality measure for this organization may also vary depending on the relationship being considered. For example, they may be the agency with the highest centrality when examining the relationship “information exchange.” However, if the relationship being examined is “joint planning,” this same organization could be less central, with other organizations having higher relative importance on that relationship. Therefore, network structure should be considered for each relationship type.

Network structure can be viewed in terms of individual organizations in the network (micro scale), or for the network as a whole (macro scale). Cohesion represents a set of measures that refer to the whole network, and are thus macro scale measures that refer to the overall integration of a network. For any relation type, these measures can be used to compare networks. These “whole network” measures can provide comparative insights when examining information exchange and community health planning. Both whole network and single-actor measures in network analysis can also provide insights into how agencies access and share information, the control of information and resources, or the ability to act together. Embeddedness theory refers to the idea that behavior takes place within the context of the social structure of the network (Granovetter, 1985). This is important in that social ties shape the flow of information as well as the implementation of decisions of resource distribution that are made as the result of local planning processes. In this study, individual and whole network measures of network structure were used to explain how information was shared and

distributed across the public health system to drive performance management. In addition, the study examined the role of the local governmental health department in information exchange. When considering one agency within an interorganizational network, individual centrality scores can be compared over relationship types to assess the relative influence of these organizations in different contexts. For example, an organization might be less central in joint planning (comprehensive community planning) processes, and more central in the electronic exchange of clinical data. This is important because the sharing of information occurred for the purposes of both planning and resource allocation. Within the context of a public sector characterized by networked forms of governance and service delivery, public health leaders are challenged to (1) demonstrate that specific investments in public health infrastructure have resulted in measurable health outcomes; (2) manage and coordinate community-wide interventions involving multiple organizations with no clear lines of authority for ordering action; and (3) being accountable within the context of intergovernmental systems through multiple pathways of accountability

The research questions below are presented in terms of overarching areas of inquiry, followed by sub-questions that addressed the specific context of the case being investigated:

- (1) How do accountability relationships in local interorganizational networks influence information system practices? How does network structure influence how information is shared and used for network-level quality improvement activities?
 - a. How do accountability relationships in the local HIV/AIDS network influence the use of information in performance management? How does network cohesion influence the use of information system practices required for program planning and performance management?

(2) What are the key environmental factors influencing change in public health network structure?

What is the role of the local governmental public health agency within the network in adapting to change?

- a. What are the key external forces driving change in the HIV/AIDS system of care? How have these changes influenced cohesion of the network? How does the local health department influence integration of the HIV/AIDS system of care?

(3) How do central actors support data exchange and knowledge dissemination across organizations in public health networks?

- a. Which organizational relationships are most important in facilitating the application of information and knowledge to system improvements? How do information exchange practices enhance network level knowledge management?

Leadership Implications and Relevance

The purpose of this study was to explore the nature of local public health systems as inter-organizational networks, and specifically examine a local HIV/AIDS treatment and prevention network for best practices in information systems management. Using Checkland's conception of an information system as a feedback process, this study focused on the purposeful use of data for a specific end. In this case, evidence was presented that demonstrated how clinical data was used to improve quality of services and benchmark health outcomes. Since public health programs are increasingly funded and implemented across many actors, an understanding of network concepts in general, and in network analysis specifically, offers the public health leader insight into the behavior and motivations of organizational actors. Additionally, the network metaphor (and network methods) provide a set of tools that can be applied at the systems level. When individual leaders (such as a Ryan White Grantee) are responsible for reporting health outcomes for a network of contracted service providers, approaches

that can influence the behavior of individual actors can be beneficial in achieving health outcomes and establishing accountability to funders, elected officials, and other stakeholders. The term “strategic network management” refers to the application of leadership practice across interorganizational networks, and the tools of social network analysis (SNA) support an understanding of the larger (public health) system. Checkland and Holwell (1998) described a conceptual model of the information system as information feedback facilitated purposeful action of the organization. The model illustrates the relationship between information feedback and resource allocation and collective program planning and service delivery. This study showed how interorganizational systems (1) coordinate the delivery of essential public health services; (2) adapt to change in the information environment; and (3) adaptively respond to processes of integration within health systems. This not only involved the implementation of evidence-based practice, but the capacity to develop information systems (e.g. network level knowledge management), support IT infrastructure, and respond to external forces driving integration between public health prevention and clinical care programs. An understanding of public health systems in terms of networks can enhance the management, sharing and co-creation of knowledge in public health, and demonstrate effective practices that support these efforts.

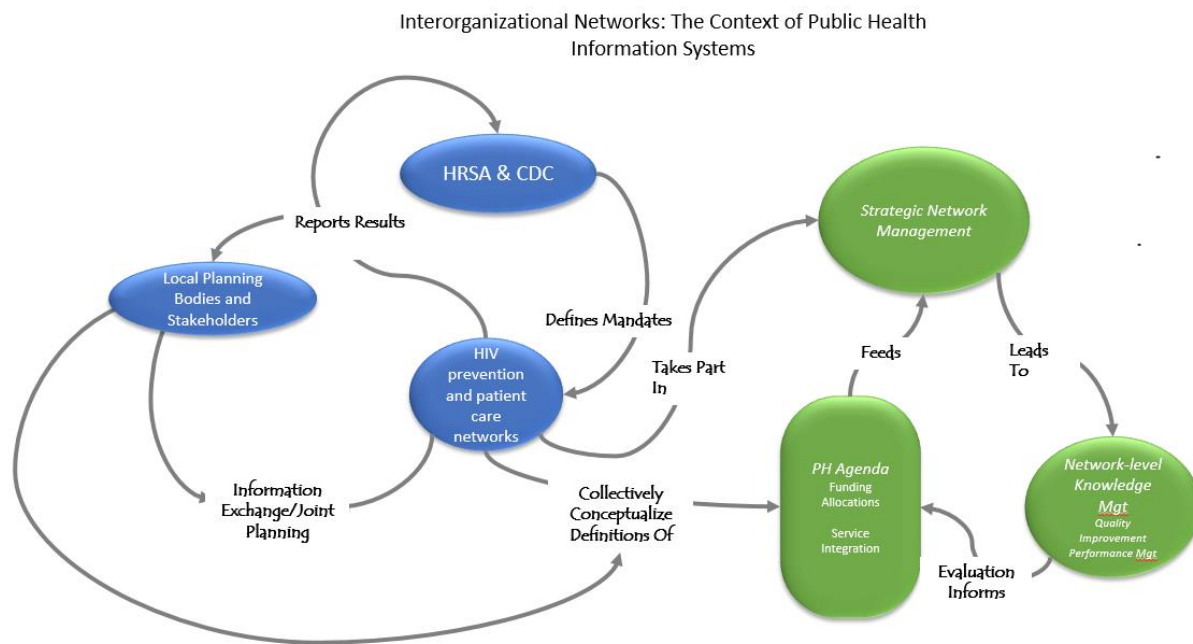
The challenge presented to leaders of public health networks relates to the ability to predict and respond to changes in the external environment. Examples include (1) the impact of federal healthcare reform legislation; (2) an economic recession that has reduced the capacity of public health agencies (NACCHO, 2010); and (3) “epidemiologic shifts” that have pushed the focus of public health practice from exclusively infectious disease prevention to include chronic disease prevention (Mokdad et. al., 2010). Accountability for improving the health status of populations requires collaborative leadership in planning and implementing public health programs, and a level of sophistication in informatics and data analysis that can provide evidence that spending on public health infrastructure will result in improved health outcomes at the population level. The role of public health leaders will be to ensure that

adequate human and technical resources are secured, and that management practices across the networked forms of service delivery support mutual accountability for achieving health outcomes.

Chapter II. Conceptual Framework and Literature Review

The literature reviewed for this research was organized based on a conceptual model (below) that adapted Checkland and Holwell's model of organizational information systems to the level of interorganizational network. The literature review considered network theory as a means of understanding public health systems as interorganizational networks, and information systems theory to describe the use of data for action and accountability across interorganizational public health systems. Accountability was described as a relational communication process that represents rules established by governing entities. The discussion recognized that accountability in public sector networks occurs in two dimensions: (1) local horizontal networks where services are organized and delivered, and (2) vertical networks that are part of the federal system of governing in the United States. This study recognized that federal and state agencies are critical actors in the public health system, but the emphasis here was on local planning and service delivery networks. Federal and state actions and organizational actors were considered as factors that influenced the evolution (and current structure) of local networks. Network theory was presented as a conceptual grounding that linked accountability to information sharing and performance management practices within local public health systems. HIV/AIDS prevention and treatment programs were considered as a distinct, interorganizational public health system.

Figure 1. Research Conceptual Model



Conceptual Framework

The conceptual model (figure 1) informing this study was built on Checkland and Holwell's work (1998), which described organizational information systems. Under this model, Checkland considered both "information system" and "organization" to describe how purposeful action supports the application of learning to the organizational enterprise. For organizations, Checkland distinguished between "hard" and "soft" approaches to organizational study. The hard strand viewed organizations as "goal-seeking entities and that the role of information is to aid decision making; research can take the form of hypothesis testing experiments in the manner of the natural sciences." The soft approach was described as an interpretive approach that views organizations as, "relationship-managing entities," where "information is relevant to sense making and research approaches...that derive from interpretive social sciences." Checkland noted that the IT field tends to gravitate towards the hard approach, while

proponents of the soft approach recognize the need for information systems to support organizational change and organizational learning.

Checkland then described the organization as the context for information systems. The organization combines a structure for managing people and resources to make decisions to achieve a goal or purpose. Checkland tended to take an interpretive stance concerning the nature of the organization in which competing interests constantly renegotiate and conceptualize the needs and aims of individuals and sub-groups within the organization, and that the information system represents the broader process by which data is transformed from information to knowledge, and knowledge is applied to organizational learning. While IT plays a critical role in generating and maintaining data, it is the transformation of that data into knowledge that is represented by the information system.

For the conceptual model in Figure 1, Checkland's organizational context was adapted to the level of interorganizational network, and to a specific type of public health network: the HIV/AIDS system of care. At the center are patient care and prevention interorganizational networks, which represent organizations funded by HRSA and CDC, respectively. A second adaptation from Checkland was the addition of Authorizers/Funders and Community Stakeholders/planning bodies as additional institutional entities common in HIV/AIDS systems of care. Key relationships between CDC/HRSA and the local network were represented by mandates defined from above, and reporting results as feeding compliance information back to the authorizing entities and to local stakeholders. The entities on the left side of the diagram represent the organizational actors that comprise and interact within the local network. The right side of the diagram represents the information system practices that the local network employed to drive purposeful action. Checkland's original model focused on the single organization, and the model in Figure 1 expands this to accommodate the reality of public health practice as an interorganizational, multi-level enterprise.

Since the public health enterprise involves multiple organizations, the definition of the public health agenda is a collective endeavor. In the revised model, public health agenda setting for HIV/AIDS involved resource allocation and service integration. The model further illustrates how this collective agenda feeds collective dialogue, and that for this process to be effective, multiple network relationships need to be effectively managed. It is the strategic network management of relationships that enable action to be taken to address the public health agenda. Evaluation of this action, represented by network-level knowledge management, allows for the occasional redefinition of the public health agenda.

The research questions presented earlier addressed key areas of interest illustrated by the conceptual model. The first research question addressed how information system practices in the local network were influenced by (a) mandates promulgated by federal funders in the intergovernmental system, and (b) network cohesion. The model depicted accountability as a bi-directional set of processes. In one direction, Authorizers/Funders define mandates that are applied to the local public health system. That local system, in the opposite direction, reports results to both the Authorizers/Funders as well as local community stakeholders. This research focused on collective accountability for health outcomes, but other forms of accountability were recognized, such as contract compliance and conditions of grant award, among others. Local network structure was described and measured by analyzing the influence of individual organizations, as well as the cohesiveness of the overall network. The information exchange practices (e.g. health outcome data/local knowledge/network-level learning), and the way these practices supported mutual accountability for health outcomes, was a central concern of this line of inquiry.

The second research question was concerned with the external factors that drove structural change in the local public health network. The focus here was on HIV patient care and prevention programs as distinct areas of practice, and the way integration across these practice areas occurred. The

role of the governmental public health agency in this integration process was another area of interest. As a key link to the intergovernmental system, the local governmental health agency is often a key facilitator of change, as well as a local leader in managing network relationships. A focus on the role of the local governmental agency in HIV service integration was therefore a priority.

The third research question focused on the information system processes and practices that supported purposeful action of the public health system and network-level knowledge management. This is represented in the conceptual model on the right side of the diagram, which illustrates the relationship between agenda setting, managing of network relationships, collective action, and network-level learning. This third-order learning process is represented by the feedback process of evaluation findings informing the agenda setting process. The research addressed how central actors in the public health network impeded or facilitated this process, as well as the identification of best practices in information systems design.

An understanding of the relationship between public health networks, network (mutual) accountability for health outcomes, and the role of information systems in the public health enterprise can lead to more effective management of the relationships that are critical for success. Public Health Systems and Services Research (PHSSR) is an emerging field of inquiry that seeks to explain the relationship of health outcomes with the structure, function and financing of the public health enterprise. The development of accountability measures for public health system performance with applicability across state and local jurisdictions is one area of PHSSR that has received considerable attention. Underlying the PHSSR agenda and the drive towards public health system accountability is the capacity of public health organizations to collect and analyze data, translate quantitative and qualitative data into actionable information, and apply knowledge to a continuous cycle of quality improvement.

Information Systems

In this research, the concept of the information system considered several aspects of information infrastructure in public health practice. Checkland and Holwell (1998) distinguished between information technology (IT) and information systems. IT refers to the physical hardware and software that comprise an organization's physical data assets, while the term information system refers to the *context* of IT. This also includes the practices related to data use for the purposes of verifying accountability and sharing knowledge across the interorganizational network.

The IOM (2003) described public health information systems based on the key components of surveillance systems, laboratory information systems, and communications systems, with recommendations for developing a National Health Information Infrastructure. O'Carroll et al (2003) defined public health informatics as, "the systematic application of information and computer science and technology to public health practice, research, and learning." In O'Carroll's exploration of the field of public health informatics, information systems referred to the physical infrastructure that supports data management and analysis. Checkland and Holwell (1998) defined information systems more broadly.

Public health informatics capacity was a second area addressed by the Turning Point Program in the National Excellence Collaborative for Information Technology. The purpose of this initiative was to examine the quality and use of information systems at the state and local level. While this effort did result in the identification of common public health information technology (IT) applications, the report also indicated that a thorough knowledge of public health business processes was needed to link excellence in IT system designs to improvements and support of public health business processes (Robert Wood Johnson Foundation, 2005). The National Association of City and County Health Officials (NACCHO) built on this work by publishing a study on public health business processes (Taking Care of Business), and more recently, a national study of "informatics readiness" (NACCHO, 2009). The

relationship between informatics/IT capacity, accountability for population health improvement, and governance relationships, while not explicitly addressed, was apparent in these recent initiatives to define and improve public health infrastructure.

What this recent history demonstrates is that the intersection of data collection and use, information systems and information technology infrastructure, and performance management systems are critical and related components in establishing mutual accountability for health outcomes in public health systems. More recently, national practice organizations have proposed an expanded conception of the public health system. In its 2003 report, the IOM described the public health system as the "intersectoral system that comprises the government public health agencies and various partners, including communities, the clinical care delivery system, employers and business, the mass media, and academe." More recently, in 2011, the Institute of Medicine published *"For the Public's Health: The Role of Measurement in Action and Accountability,"* in which the term "public health system" is replaced by "health system" to emphasize "...the proper and evidence-based understanding of health as not merely the result of medical or clinical care but the result of the sum of what we do as a society to create the conditions in which people can be healthy." The rationale for making such a distinction was based on the argument that improving the delivery of clinical care will not by itself drive significant improvements in population health. Public health and medical care systems, when considered each as interacting agents in a dynamic health system, become mutually accountable for population health outcomes. As the structure, process and outcomes of the health system are viewed in their entirety, accountability systems require "data sharing between public health and medical care organizations." In this study, the HIV/AIDS system of care was presented as a unique case where integration between clinical care and HIV prevention programs provided an example of a mature "health system" (Institute of Medicine, 2011).

As governmental public health agencies continue to adapt to changes in the healthcare system,

as well as evolution in federal mandates under specific public health programs, this comes with the realization that, "measurement, laws and funding are three major drivers of change in the health system...Although the causal chains between actions of the health system and health outcomes are not always clearly elucidated, measurement is a fundamental requirement of the health system" (*IOM, 2011*). Systems of data collection and analysis also provide information to monitor investment of resources into the public health system. The ability of public health agencies to collect, analyze and interpret clinical, administrative, and surveillance data from a variety of sources can be considered as critical elements in an emerging accountability framework.

The goal in *IOM 2011* was to "review population health strategies, associated metrics, and interventions in the context of a reformed health care system." The committee reviewed the development of performance measurement in both clinical care and public health systems, and offered a series of recommendations. These measures were projected to result in a uniform, national system of performance measurement, health system accountability, and population health measures that could be used to compare jurisdictions across the nation. The committee found that "the US lacks a coherent template for population health information that could be used to understand the health status of Americans and to assess how well the nation's efforts and investments result in improved population health." The overarching need is for a system that builds "synergy between the best evidence-based interventions at the population level and in the clinical setting."

Across seven recommendations, *IOM 2011* emphasized standardization of health service and health outcome data across jurisdictional levels, and the need for integration between public health agencies and medical care organizations. Regarding the former, IOM recommended that the Department of Health and Human Services (HHS) develop standardized indicators that could be used to assess the health of individual communities, as well as serve as a set of core, national health outcome indicators. The report cited the development of health information technology in general, and electronic

health records specifically, for use in public health practice. However, the committee also cautioned that, "...to ensure that new investment meets all the stated goals, it is not used largely to maximize the use and usefulness of clinical-care data in the care delivery system in isolation from population health stakeholders..." In the context of the ACA, the committee concluded that the Act's "emphasis on prevention and its other population-health-oriented provisions offer an opportunity to consider ways to integrate clinical care and public health efforts to contribute to improving population health," and that, "both clinical care and public health stakeholders need to benefit from the data-sharing relationship" (Institute of Medicine, 2011).

Two recommendations built on the theme of integrating public health and clinical care as organizational systems, and in integrating the use of data across these sectors for performance improvement and accountability. Recommendation four stated that governmental public health agencies and medical care organizations should "share information derived from clinical data sources to inform relevant population health priorities." In recommendation five, the committee stated that, "state and local public health agencies...collaborate with clinical care delivery systems to assure that the public has greater awareness of the appropriateness, quality, safety, and efficiency of clinical care services delivered in their state and community." The recommendations outlined in *IOM 2011* suggest a need for governmental public health agencies to evaluate current and future relationships with medical care organizations, as well as their own capacity to utilize clinical care data for health surveillance and community health planning. *IOM 2011* illustrated potential future integration between public health and medical care organizations around shared accountability for population health outcomes at the level of the local jurisdiction. This suggests that the development of performance measures, public health informatics capacity, and integration of public health and medical care are inextricably linked around population health goals. While integration within the "health system," as defined in this report, will likely present many challenges to state and local public health agencies, consideration also should be

given to the ways in which change at the federal level influences local (horizontal) multi-sectoral public health networks.

Two years after the publication of the 1988 Institute of Medicine Report, “The Future of the Public’s Health” was published, the US Congress passed the Ryan White Care Act. This program has evolved into a coordinated system of clinical care for patients infected with HIV/AIDS. With an emphasis on clinical care and quality improvement, this public health program has advanced the integration of quality improvement and performance management in public health practice. As it evolved parallel to the RWJ Turning Point program, with its emphasis on performance management in governmental public health, local systems of care focusing on HIV/AIDS can provide insight into other public health systems where performance management techniques are less ingrained. Ryan White programs offer rich examples of the use of clinical data for population health improvement and accountability, as envisioned in IOM 2011.

Network Theory and Interorganizational Systems

The network metaphor has been utilized in the public management literature to understand the dynamic nature of relationships between public sector organizations. While the public management literature uses network theory as more of a descriptive metaphor to describe interorganizational networks, there is less emphasis on the use of relational data and social network analysis (SNA) to measure their structural characteristics. In public health research, there is a history of SNA in investigating population health dynamics, diffusion of innovations etc., but less emphasis on public health systems as interorganizational public management networks. Public health network studies have been applied to intra-organizational phenomenon (Merrill and Carley, 2010), but there is a need to consider the public health system as an interorganizational network, and to further describe the relationship patterns between organizations. Luke and Harris (2007) published a literature review that

surveyed the use of network analysis in public health research and suggested future areas of network research. Public health network analysis occurs in three categories: transmission networks, social networks, and organizational networks. Transmission networks refer to the flow of elements between actors, and this can include the flow of disease, resources, or information. For information flow, there is a history of research in the diffusion of innovations that addresses the influence of social relationships, specifically the network characteristics of actors, in the adoption of innovations or evidence-based practice (Valente, 2010). For example, several studies have investigated the relationship between social support and social capital with the health of communities, availability of resources, and patterns of resource exchange. For organizational networks, Luke and Harris recognize prevalence of SNA in business and political science, but observe less use in studies of public health systems. They suggest that organizational network analysis can contribute to the knowledge base of public health systems and services research: "future research in this area could include structural evaluation of public health systems and evidence-based recommendations for developing effective relationships within these systems."

Berry and Brower (2005) reviewed the public management literature that addressed both inter-sectoral and intergovernmental management. The authors traced the interest in interorganizational governance to Salamon's (1981) use of the term "new governance," which described the interaction between public, private and nonprofit organizations in delivering public services. In the 1990s, "new public management" was popularized by Osborne and Gaebler (1993) in the book *Reinventing Government*, and emphasized total quality management, accountability, and performance measurement in the public sector. The authors also focused on the mechanism of "contracting out" as common policy tools in public sector governance. While recognizing the need to understand formal mechanisms in use across interorganizational networks, so called "dark networks" represent informal influence on public policy and exercise considerable power outside of formal governance arrangements.

They remind the reader that “networks are not only about executing the public will, they are also about the exercise and maintenance of power.”

Another concern related to the delivery of public service by cross sectoral networks is related to knowledge management and information flow. The authors cautioned that, “as public agencies get out of the business of front-line service provision, they gradually relinquish possession of professional knowledge for providing the services, until expertise increasingly resides exclusively with nonprofit and private providers.” Barriers to knowledge exchange and information flow can also be problematic as electronic firewalls and organizational/programmatic silos discourage knowledge transfer. Instead, networked forms of governance require networked forms of learning: “Collaborative service provision will increasingly call for network participants to work together in third-order change, that is, to possess an awareness of the network’s own change processes, learn from these processes, and work collectively to adapt the network for greater effectiveness. What is implied is that the network’s participants must be continuously attuned to identifying the network’s critical leverage points.” This recognizes the connection between accountability, the dynamic nature of information exchange, and network-level knowledge management.

Organizational Network Analysis in Public Health Systems and Services Research

Network studies in public health systems and services research (PHSSR) have provided some understanding of processes within and between organizations. Mays and Schuttfeld (2010) proposed a typology of “public health delivery systems” by presenting a method of classification based on structural characteristics of local public health organizational networks. Citing a wide variation in public health practice across local jurisdictions, the authors were interested in how public health services were organized and delivered across different types of jurisdictions.¹ The author’s conceptual framework for

¹ What is less clear is the distinction between the terms “public health service delivery system” and “public health system.” The authors

public health delivery systems was built on organizational sociology and industrial organization economics literature, with the main constructs derived from Bazzoli et al (1999) described three classes of attributes of healthcare delivery systems. These were differentiation, integration, and centralization. In this framework, differentiation referred to the number of different services being provided; integration referred to the extent to which these services are coordinated across network organizations; and centralization referred to the concentration of responsibility for service delivery with one or more organizations. A distinction was made between the term “centralization,” which the authors used to refer to the vertical distribution of authority between state and local governmental agencies; and “concentration,” which referred to the local, horizontal distribution of authority. Citing previous PHSSR literature, the authors suggested that decentralized intergovernmental relationships provide superior public health services due to the proximity of local units to the population. However, this conceptualization of “centralization” does not appear to be tied to a specific measure of centralization rooted in the traditional methodologies of social network analysis.

Recent emphasis on network studies in PHSSR literature emphasize the management and leadership implications of the interorganizational network in public health practice. Varda (2008, 2010) focused on public health collaboratives and “strategic network management.” Varda investigated connectivity in public health “collaboratives” to identify strategic management approaches to building and sustaining key organizational relationships. This study suggested that public health personnel need to “know how to quantify and analyze the collaborations they are involved in....” and described “strategic network management” as a process of leadership and relationship management at the local level. Varda described the dimensions of connectivity that are critical to the success of the public health enterprise. For example, public goods theory emphasizes the role of trust and resource exchange as key

recognize both the inter-organizational and the intergovernmental nature of public health systems, but focus primarily on service delivery,” with the stated intent being to classify “heterogeneous organizations and delivery systems in order to compare performance and outcomes.” The authors cite the IOM definition (1988) of the “public health service delivery system,” but the IOM in 1988 and 2003 defined the “public health system” and in 2011, the “health system,” not “public health service delivery system”

relational types that are important for public health practice. Varda also suggested that public health collaboratives (PHC) can take various forms, depending on the specific focus. For example, one might be focused on improved service delivery; another on policy development. PHCs are viewed as a distinct form that delivers a public good that can be enjoyed equally by anyone regardless of the return being delivered to any one agency.

The literature described above provides a conceptual understanding of public health systems as interorganizational networks. This research focused on a specific public health context. HIV/AIDS prevention and treatment is one domain of public health practice that provided rich cases of inter-organizational coordination, network-level knowledge management, mature information systems, and performance management frameworks. HIV/AIDS systems of care have also been studied as inter-organizational networks.

Kwait et. al. (2001) described the evolution of HIV/AIDS service delivery networks from the beginning of the epidemic, when existing medical services providers were slow to respond. Thus, AIDS service organizations (ASOs) emerged as entities specifically oriented to the needs of people living with HIV/AIDS (PLWHA). As the epidemic grew, the existing healthcare organizations began to develop HIV/AIDS treatment programs, and ASOs developed primary care expertise and programs. Given the need for support services, it was not uncommon for clients to seek services from multiple organizations to meet their needs. Thus, network coordination and information sharing in HIV services networks were uniquely well-developed, and centrality of ASOs within these networks was particularly important for service coordination and delivery. This study examined which organizations were most central for referral and information sharing relationships, and found that coordination was higher for service delivery networks than planning networks. Cruise (1997) discussed the evolution and dispersion of HIV services in Florida, specifically focusing on the growth of ASOs since the beginning of the epidemic. The author noted that the onset of the epidemic occurred simultaneously to President Reagan's "New

Federalism,” where powers and responsibilities for public services was devolved to the state and local level. At the onset of the epidemic, local and state governments were not able to effectively respond to the crisis, and ASOs were created to assist in the response. Many of these ASOs had roots in the gay rights movement, and treatment of care for HIV became heavily represented by the nonprofit sector rather than by governmental public health agencies.

Indyk and Rier (2006) described a “geometry of care” for HIV, focusing on efforts to “maintain the organizational infrastructure with which to link diverse players and sites, and to combine these into a web for production, assessing, and exchanging the information needed to combat HIV/AIDS.” The author described the importance of developing and maintaining relationships between community-based organizations (CBOs) and academic medical centers in supporting clinical care. This relationship was viewed as important as an interdisciplinary linkage that promotes the diffusion of evidence-based practices.

Darrow et. al. (2009) discussed a model of “coalition contract management” as a systems change strategy for HIV prevention in Broward County, Florida. As part of a Racial and Ethnic Approaches to Community Health (REACH, Centers for Disease Control and Prevention) a university partnered with minority CBOs in a community planning process. The goal was to coordinate efforts to implement a community action plan, with the university taking the role of ‘contract manager.” The author described the role of the contract mechanism in managing the planning network, but found that collaboration was not maintained after funding for the REACH project ended.

Konigsberg (1989) described the creation of an HIV/AIDS provider network in Broward County, Florida in the early stages of the epidemic. The Broward County Public Health Unit (local health department, LHD) recognized the burden the epidemic was placing on the County’s two public hospitals. The LHD partnered with Jackson Memorial Hospital (Miami) and the South Florida AIDS Network in a Robert-Woods Johnson (RWJ)-funded project to provide treatment and support services. Since the RWJ

project was Miami-based, the LHD in Broward County sought additional funding to create the County's first primary care clinic for HIV/AIDS services. Konigsberg recognized that it was unusual for a local health department to be involved in providing such high levels of medical care, but that," such an endeavor is consistent with the movement in Florida to involve county public health units in primary care."

Recent biomedical research also has the potential to influence the structure of HIV/AIDS service delivery at multiple levels of the system of care. Cohen et al (2012) demonstrated that the risk of transmitting HIV was significantly reduced in patients that had achieved viral suppression. The impact of this study led to the strategy of "treatment as prevention" in the Ryan White program. With an emphasis on the early identification of infected individuals, linkage and retention in care, prescription of Highly Active Anti-Retroviral Therapy (HAART), and viral suppression, Ryan White programs increased coordinating efforts with HIV prevention programs (typically funded by the CDC). At the federal level, CDC and HRSA were actively engaged in the coordination of programs and planning. The treatment-as-prevention strategy can be seen in such initiatives as the HIV Care Continuum Initiative and the National HIV/AIDS Strategy (Office of National AIDS Policy). These initiatives were sponsored by Office of National AIDS Policy (ONAP) and implemented by CDC and HRSA. At the local level, federal directives have recently been manifested in requirements for integrated planning between CDC-funded prevention programs and Ryan White patient care programs. The way treatment and prevention became integrated was one focus of this research.

General Network Theoretical Considerations

Networks are defined as patterns of relationships that connect people, institutions, or objects (Heaney, 2011). Social network analysis (SNA) recognizes that all human activity is embedded within social networks, and that SNA studies are useful in understanding complex interorganizational systems.

When conducting SNA studies, it is important to determine the boundaries of the system being studied, and to clarify assumptions regarding which actors are included and excluded. Networks are comprised of actors (organizations, individuals, objects, etc.) that are linked to other actors through relational ties (In the network literature actors are referred to as nodes, and ties are referred to as edges). These ties can be informal (one actor “knows” another actor) or formal (contractual relationship between actors). Sets of actors can also have multiple types of relationships (multiplexity) with other actors (Wasserman and Faust, 2009).

An important consideration for this study was the nature of the relationships (ties) between network actors. These ties can be characterized as directional (one-direction, bi-directional, or undirected), dichotomous (present/absent) or valued (measured) on a scale (Wasserman & Faust, 2009). Ties between actors can represent different relational types. The nature of the relationships (ties) between organizations also impacts the interpretation of network measures, as network structure is typically measured for each type of relational tie. For example, network measures such as centrality in a trust network would have different implications than centrality in a conflict network. In this study, the primary relationships of interest were defined as (1) relationships formed by statute or through grant or contract funding mechanisms; (2) communication between clinical service providers through community planning or data exchange; (3) reporting of program outcome data to authorizing stakeholders; (4) reporting of financial or outcome data to non-governmental funders.

Each of these relationships generates a distinct set of network measures, which can then be compared across relational types. In this study, ties were considered as undirected and dichotomous. (One exception is the network of reporting relationships. In this, ties are directed to indicate who reports to whom). In other words, if actor A indicates a relationship with actor B, it was not required that actor B confirm that relationship. The relationship was either present or absent. These ties represented relationships between actors, which in this study were organizations that were part of the

HIV/AIDS system of care. This included organizations funded under Ryan White Part A and Part B, organizations funded under CDC's High Impact Prevention program in Broward County, and other nonprofit and private organizations that participated in the HIV-related community planning processes.

There are several network types that can be studied. One-mode networks involve a single set of actors, which may or may not be characterized as multiplex. Two-mode networks involve two sets of actors, where each set is only indirectly linked to the other. For example, a set of actors could be related to each other because they attend the same event, instead of having a formal or informal relationship. Finally, an egocentric network is based on the identified relationships of a single actor, rather than multiple actors indicating relationships with other actors. In this study, the focus was on the local HIV/AIDS system of care as a one-mode network.

When conducting SNA, it is important to understand which network measures will be used in the analysis, and how these measures support conclusions of the research questions. In this study, measures were categorized as "macro" or "micro." Macro measures considered the structural characteristics of the entire network, while micro measures considered the structural position of individual actors within the network. Macro measures of network centralization are referred to as network cohesion. Specific measures of network cohesion used in this study included average degree, density, centralization, fragmentation, diameter, connectedness, and average degree. Hanneman and Riddle (2005) describe density as a measure of social isolation within a network. If there is a higher number of dyadic connection (actor to actor), then there are less individual actors that are unconnected to other actors (isolates). Distance is defined as the longest path between any single pair of actors, and density is a measure of total ties as a proportion of total possible ties. A network with high density is less fragmented, and better positioned to take purposeful action. Centralization is a measure of the extent to which a network is dominated by a few central actors. This is important in understanding the distribution of power and influence across a network. Similarly, average degree is an alternate measure

of this distribution, and measures the average degree centrality across all actors in the network. Overall, measures of cohesion are relevant for this study in comparing different relational networks consisting of the same actors, specifically differences between patient care and prevention networks. Consideration of overall network cohesion is also useful to describe the context within which individual organizations may facilitate or influence the sharing information and resources.

Macro, or “whole network,” measures were also considered by Provan et. al. (2007) in their literature review of studies that considered network analysis at the level of the whole network. They recognized the broad extent of studies examining the structural position of organizations within networks, and that there was a need for more research at the network level. The authors state that by analyzing networks at the level of the whole network, conclusions regarding how networks are governed, or network-level outcomes (such as network learning) could be generated. They state that, “by focusing only on the members themselves and their interactions with others, the importance of individual organizations tends to be exaggerated and the importance of collective behavior underemphasized.” They argue that these positions can be complementary in network studies. When examining individual organizations, researchers can consider the influence of organizations on other organizations, or the influence of the whole network on individual organizations. Additionally, one might consider the influence that individual organizations have on the whole network, or the influence of the whole network on network-level interactions. While statistical measurement of the influence between macro and micro-level measures can be problematic, it is important to distinguish between levels of analysis, and to attempt to demonstrate how network structure at both levels influences the behavior and outcomes of interorganizational work.

Micro measures in this study were concerned with the influence of individual actors within a network. In this case, measures of organizational centrality were relevant for this study. Hanneman and Riddle (2005) discuss centrality in social networks in terms of power. Power in a social network is

derived from relationships, and the ability to influence others. In terms of the macro scale, the authors state, “If a system is very loosely coupled (low density) not much power can be exerted; in high density systems there is the potential for greater power. Power is both a systemic (macro) and relational (micro) property. The amount of power in a system and its distribution across actors are related, but are not the same thing. Two systems can have the same amount of power, but it can be equally distributed in one and unequally distributed in another. Power in social networks may be viewed either as a micro property (i.e. it describes relations between actors) or as a macro property (i.e. one that describes the entire population); as with other key sociological concepts, the macro and micro are closely connected in social network thinking.” The distinction between macro and micro levels of analysis was important for this study, as the research questions addressed both the overall structural characteristics of the HIV/AIDS service delivery network, as well as the individual influence of the local governmental public health agency.

Centrality can be measured in several ways, and these measures are useful in determining the characteristics of an actor’s structural location and “power” within a network. Degree centrality is a measure of the number of total ties an actor has with other actors as a proportion of the total number of possible ties. An actor with a greater number of ties has more options for acquiring resources, communication, etc. than other actors. Actors with high centrality have more autonomy, and thus more power. Betweenness centrality is a measure of an individual actor’s place on a geodesic path between other actors. If an actor is between the path of more sets of actors than others in the network, that actor is in a favored position as more actors will depend on it for connections to others. In this study, betweenness centrality was used to determine which actors were most important in the integration of patient care and prevention programs. In addition, betweenness centrality is a useful measure to analyze which organizations have the most influence within individual network cliques. Valente (2010) recognized the importance of centrality in network studies, stating that “the pattern of central nodes

and the behavior of those nodes provide the keys to network structure, evolution, and influences on behavior.” Analysis of centrality in interorganizational studies also provides insight into which organizations reside in the core, and which reside on the periphery of the network. Organizations may move between core and periphery depending on the relationship of interest.

A measure closely related to betweenness centrality is brokerage. Brokerage refers to the position of an actor within a network where their position between cliques puts them in an advantageous position to mediate interactions between other cliques. Brokerage centrality is defined as the degree to which an actor “occupies a brokerage position across all pairs of alters” (Hanneman and Riddle, 2005). In this study, brokerage was important in addressing the role of central organizations in facilitating integration across patient care and prevention-oriented organizations, as well as identifying organizations that mediated the flow of information within the network.

A focus of this research was the influence of central actors in the flow of information and as facilitators of integration within the public health system. Network theory informed the supposition that central actors in local public health networks were important in this regard. Central actors facilitate exchange of information and resources across networks to otherwise unconnected actors, and this could be important where actors don’t know each other, or where there exists a lack of trust. Scott (2007) made a distinction between centrality and centralization. Centrality refers to the focal prominence of a single actor within the network, while centralization refers to the overall cohesion of the network. One might assume that in public health networks the local governmental agency is usually the most central actor, but one must also consider that some other organizational actor could have a central role for a specific relationship type. Of interest was the impact of central actors within whole networks that link otherwise separate cliques (i.e. patient care vs. prevention). Pfeffer and Silancik (1978) used resource dependence theory to suggest that networks create power structures that affect the flow of information and resources. Centrality of an individual actor in a network might therefore

imply control over resources and information, making other organizations more dependent on a central organization.

Accountability and Network-Level Knowledge Management

The interdependent nature of the federal structure of government in the United States directly impacts the relationship structures and activity patterns of public health systems. However, this interdependence also extends to other sectors and entities that are involved in the public health enterprise. *IOM 2011*(pg. 4-18) discussed public health system governance in the context of complexity theory:

Complexity theory would mandate an ongoing adaptable governance process. The history and operating style of the governmental public health agency mirrors in some ways that of public administrative structures and even of large organizations in the private sector. State and local public health agencies have traditionally been bureaucratic, operated in a linear, predictable, and planned manner, and with the exception of the executive branch line of command, operated largely independently of any other entities. For a variety of reasons, traditional modes of governance and action in public health need to be complemented with alternative approaches depending on the specific problem. This is partly due to the widespread recognition in public health that the governmental public health infrastructure generally "owns" neither the problems nor the solutions, and thus needs to engage and collaborate with multiple stakeholders to find effective new ways to improve population health.

Intergovernmental relationships in the vertical dimension (local-state-federal) often link with local, inter-organizational networks containing state and non-state actors. These local networks are typically responsible for implementing federal or state public health initiatives. The network analogy applied to public health system governance provides a conceptual understanding of the relationship patterns between public health system organizational actors; the mechanisms by which individual actors are singly and collectively held accountable for population health improvement; and the intersection between health systems and governmental public health. Underlying the processes of demonstrating accountability in the public health system are the information systems, IT infrastructure and informatics

capacities embedded in interorganizational networks that facilitate the collection and analysis of data, and the development of actionable information to support interventions that lead to improved health outcomes.

Mischen and Jackson (2008) proposed that complex adaptive systems (CAS) and knowledge management theories can provide a conceptual grounding in the understanding of policy implementation in interorganizational networks. They argued that SNA is useful for empirically studying these networks. A CAS is defined as a system in which, “a large number of moderately connected and interdependent agents co-evolve when they find themselves far from equilibrium.” Through feedback loops, these actors “self-organize and create behavior paths within a limited space of possibility.” The authors equate the learning process from these feedback loops with knowledge management- a “third order” level of learning in which system actors share knowledge of the network for process improvement and purposeful action. In interorganizational networks, knowledge management thus occurs across the boundaries of multiple organizational entities. The authors reviewed the study of policy implementation, and noted the history of network analysis used in these studies. The authors recognized the connection between CAS theory and the implications for learning and knowledge management in interorganizational systems. Network analysis was presented as a tool to empirically evaluate the relational patterns between organizations in CAS, and to understand the dynamics of knowledge management across interorganizational networks.

Within the context of the CAS, accountability is viewed as the process by which one organization verifies compliance with a rule or standard. This can be operationalized in several ways. For example, a federal funder will establish terms and conditions of grant-in-aid funds, and the recipient organization is held accountable through the grant mechanism. At the local level, that grant recipient may further subcontract for services, and those subcontractors might be accountable to the local funder for delivering services through a contract mechanism. Lastly, the network of local providers might

collectively be accountable for achieving health outcomes, such as those documented in the National HIV/AIDS strategy. While this research touched on several types of accountability, the emphasis here was on the mutual accountability for health outcomes that are the primary responsibility of local public health systems.

The concept of mutual accountability for health outcomes implies the collective action of multiple organizations in addressing public health issues. Mutual accountability for health outcomes can also be understood by comparing the evolution of performance management frameworks centered around governmental public health agencies (sponsored primarily by CDC and the Robert Wood Johnson Foundation) with the quality management framework embedded within the Ryan White program (under the direction of HRSA). Turnock and Barnes (2007) described the history of public health practice and system improvement efforts, highlighting the early work of the American Medical Association and the American Public Health Association prior to 1950. With the publication of the Institute of Medicine report, *The Future of Public Health* (1988), contemporary application of these efforts led to significant advancement in systems of accountability, as well as a federal interest in state and local public health system performance. Since the follow up IOM report, *The Future of the Public's Health in the 21st Century* (2003), there has been increased emphasis on the development of accountability mechanisms that link investments in public health infrastructure to improved health outcomes. Since the establishment of the core functions and essential services paradigm (1988 and 1994, respectively), successive initiatives towards a system of measurement and accountability for public health practice have been supported by national practice organizations (Robert Wood Johnson Foundation (RWJF), Kellogg Foundation, Centers for Disease Control and Prevention (CDC), and others), along with state and local partners. The Turning Point Program (Performance Management National Excellence Collaborative) developed a model Performance Management System that integrated four components (performance standards, performance measurement, quality improvement and reporting results) into a

comprehensive framework for public health practice. This model provided a conceptual road map for linking CDC's National Public Health Performance Standards program with community assessment (MAPP, Mobilizing for Action through Planning and Partnerships), quality improvement, and standards for voluntary agency accreditation.

While the evolution of the performance management framework described above has focused on the governmental public health system, performance management in HIV prevention and care has evolved on a parallel path, primarily affiliated with the Health Resources and Services Administration (HRSA). With the enactment of the Ryan White Comprehensive AIDS Resource Emergency (CARE) Act in 1990, state and local public health systems were funded to provide care for low-income and uninsured persons living with HIV/AIDS (PLWHA). A core component of Ryan White programs is quality management in clinical care. Since 2004, HRSA has funded the National Quality Center (NQC), through the New York State Department of Health. NQC provides quality improvement technical assistance to Ryan White grantees and clinical providers nationally. This represented a major federal investment in the application of QI principles to public health practice. As this performance management infrastructure evolved in parallel to that of the CDC\ RWJ Turning Point Program, a second system evolved in a separate and distinct sector of public health practice. In each case, accountability for health outcomes was established within a comprehensive community planning process, but the mechanisms by which organizations were held mutually accountable to each other (and to federal funders) for achieving specific health outcomes was not always explicit.

Chapter III. Methods

Mixed-Methods Study Design

Checkland's theory of organizational information systems, adapted for interorganizational networks, provided a conceptual and theoretical framework for understanding how inter-organizational systems manage knowledge to improve network performance, achieve desired results, and establish accountability with system stakeholders. This study developed this idea by utilizing an exploratory sequential mixed-methods approach to examine the research questions. Mixed methods research was defined as, "an approach to inquiry involving collecting both qualitative and quantitative data...the core assumption of this form of inquiry is that the combination of qualitative and quantitative approaches provides a more complete understanding of a research problem than either approach alone" (Creswell, 2014).

The rationale for using this approach was to provide multiple perspectives and analysis to understanding complex systems. The exploratory sequential mixed methods research design is one in which the researcher begins with a qualitative phase, and uses preliminary analysis to inform the design of the subsequent quantitative phase. In this study, initial insights from the qualitative phase provided a contextual understanding of the system being studied that improved the overall design of the social network analysis in the second phase (see figure 2, Mixed-Methods Research Design). The study included a qualitative core (an in-depth case study), complemented by a quantitative element-a social network analysis. Together they provided a synthesis across data sources and in data analysis that addressed the research questions. On a procedural level, a mixed methods research design allowed for the comparison of the different perspectives offered by the qualitative case study and the quantitative SNA. The research design and analytical approach presented in this study addressed the research questions by (1) identifying contextual themes related to network-level knowledge management and best practices in public health information systems, and (2)

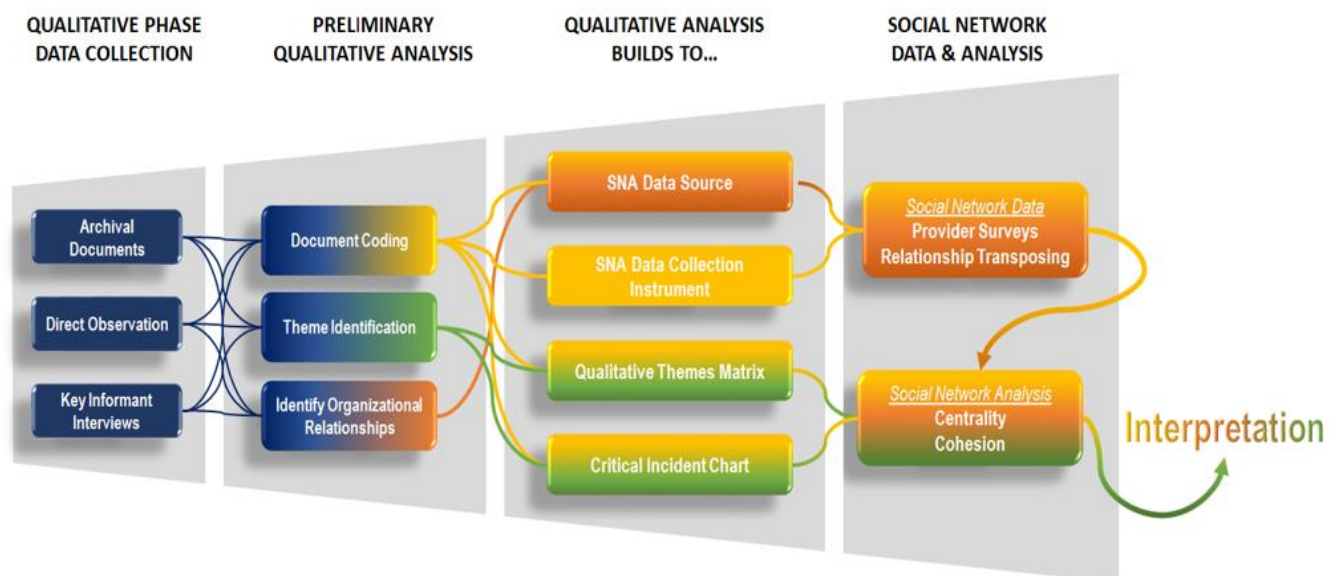
investigating the role of central actors in public health networks related to knowledge transfer, quality management, and managing network relationships. The social network analysis reinforced case study findings by quantifying the centrality of key organizations in the network. This was complemented by qualitative data from the case study that described the role of central actors in several key relationships. The research addressed the following questions:

- (1) How do accountability relationships in local interorganizational networks influence information system practices? How does network structure influence how information is shared and used for network-level quality improvement activities?
 - a. How do accountability relationships in the local HIV/AIDS network influence the use of information in performance management? How does network cohesion influence the use of information system practices required for program planning and performance management?
- (2) What are the key environmental factors influencing change in public health network structure? What is the role of the local governmental public health agency within the network in adapting to change?
 - a. What are the key external forces driving change in the HIV/AIDS system of care? How have these changes influenced cohesion of the network? How does the local health department influence integration of the HIV/AIDS system of care?
- (3) How do central actors influence practices and patterns of information exchange in public health networks?
 - a. Which organizational relationships are most important in facilitating the application of information and knowledge to system improvements? How do information system practices enhance network level knowledge management?

Figure 2 represents the overall mixed methods approach employed in this study. The research was conducted in two phases. In the first phase, semi-structured interviews, archival documents and direct observation were used for data collection. Interview guides were designed with the goal of identifying key practices related to data and information exchange between system organizations, as well as processes of accountability between system actors. Preliminary qualitative data analysis also developed relational and conceptual themes related to the public health information system and processes for establishing mutual accountability for health outcomes.

Qualitative data from the first phase provided initial data for the second phase, a social network analysis. Verification of relationships between system actors, as well as attributes from organizational actors, were transcribed into a matrix format for SNA. In this process, phase one qualitative data provided verification of initial relationship types analyzed in the SNA. In addition, identification of additional local public health system actors was incorporated into the relationship matrix. In the phase two SNA, preliminary relational data was aggregated into a relational data matrix using Microsoft Excel. A separate Excel sheet was used for each relationship of interest. A master sheet aggregated all relationships between actors, and individual sheets contained data for single relationships. Each relationship on the matrix was cross-referenced/hyper-linked with the corresponding data source. Excel data was exported into UCInet for the SNA. An organizational survey, administered over the phone, provided confirmatory data for relationships documented in the relationship matrix. Secondary data was obtained from archival documents to identify organizational attributes and document additional relationships between organizations. Across these organizations, this attribute data was utilized for the purposes of explaining network structure and relationship patterns. Triangulation across qualitative and quantitative data sources provided confirmatory evidence supporting the research findings. Specific data collection and analytic procedures are outlined below separately for the qualitative and quantitative phases of the study.

Figure 2. Mixed-Methods Research Design



Case Study Design

Rationale for Case Study Design and Site Selection: The research employed a single, descriptive case study design (Yin, 2003). The case was defined as a local public health interorganizational network (e.g. public health system). The main proposition guiding the case study held that public health systems, as interorganizational networks, function as information systems. Clinical information systems (IT) exist within and support the knowledge management activities of organizational actors within the network. The specific practices that facilitate the production of information from data, and support knowledge transfer for purposeful action, represented key points of information feedback. The use of information technology in support of information system practices was viewed as critical in assuring accountability for health outcomes and in network-level knowledge management. The goal of the case study, therefore, was to identify the practices and activities of organizational actors that facilitated network-level knowledge management, as well as barriers to knowledge management in interorganizational networks.

Data collected for the case study included key informant interviews, archival documents, and direct observation. Fourteen key informants in the local HIV system of care were interviewed using a semi-structured interview guide (see Appendix B). Interview subjects represented organizations that provided direct patient care and/or support services, organizations that provided HIV prevention services, and Part A planning council members. Questions were selected from the interview guide that were appropriate for the role of the respondent in the HIV system of care. Archival documents related to the HIV system of care were collected over a 12-month period. These included meeting minutes of the HIV planning council and its committees, state and federal Ryan White compliance reports, Part A grant applications, and other handouts provided at public meetings. Direct observation of Part A planning council and committee meetings occurred over a 12-month period. Notes were maintained over this period in field notebooks for later reference in the analysis phase. A secondary goal of the qualitative phase of the study was to identify key historical incidents (see figure 4, Critical Incident Timeline) that impacted relationships within the local network, or represented key external forces of change that leaders within the network had to manage.

The rationale for a single case study design was based on (1) the selection of a unique case context, and (2) the selection of a case site that is an “extreme example” (Yin, 2003) of the specific type of public health network being studied. The specific context for the case study is an HIV prevention and treatment network. The rationale for selecting an HIV treatment and prevention program as a specific type of public health system is based on (1) well-established use of clinical data for performance management, (2) mature service delivery networks, and (3) a history of interorganizational coordination with robust programmatic support in the Ryan White program.

The goal in making a site selection was that the site demonstrated “best practice” in the exchange and use of data across an interorganizational network. Another factor in site selection related to demonstrated evidence of integration and/or collaboration between clinical care and prevention-

oriented programs. The Broward County Eligible Metropolitan Area (EMA, Health Resources and Services Administration) was selected based on the following factors. First, the Broward EMA received a National Quality Award from the National Quality Center, a HRSA-funded technical assistance center focusing on quality improvement in HIV care. In addition, a 2013 HRSA site visit of the EMA indicated that the Broward EMA's use of data to support the local Priorities and Allocations process was a model for other EMAs. A second factor supporting the selection of the Broward EMA was the length of time their data management system (Provide Enterprise (PE), Groupware Technologies, Inc.) had been in place. The EMA adopted PE in 2002, and the length of time on this system provided the EMA the opportunity to fine-tune and enhance the system. Thus, the stability of the system and the reliability of client-level patient care data were very high. This represented key infrastructure of high quality in the EMA. A third rationale for selecting the Broward EMA related to the status of the epidemic and the incidence of HIV/AIDS in Broward County. In 2012, the EMA had the second highest case rate in the United States. In 2014, it had the highest case rate. Some factors cited by the EMA include immigration patterns from within the US, and from Central and South America into Broward County. These immigration patterns, combined with high incidence in the urban core, presented the EMA with a dynamic patient population, with a total Part A client count of over 7500. The EMA's status as a major concentration of new HIV infection thus made the Broward EMA a unique case.

Threats to Validity

Yin (2003) identified potential threats to three types of validity in exploratory case study research: construct validity, external validity, and reliability. Suggested tactics for addressing these validity threats were adopted in this study. Construct validity refers to the need to establish the appropriate operational measures for the concepts being studied. The concepts being studied were the practices and activities that facilitated effective, network-level knowledge management in the public

health system. The qualitative analysis plan utilized a coding scheme (Miles & Huberman, 1994) that was applied across multiple data sources to identify specific practices and activities, as well as to assist the researcher in identifying themes related to the research questions. In addition, key informants familiar with HIV public health practice in Florida served as external reviewers for the draft case study report.

External validity in survey research refers to statistical generalization. Case study research, in contrast, relies on analytical generalization (Yin, 2003). In this study, the case study results were generalized to Checkland's theory of information systems, which were adapted to represent a specific public health context at the level of public health network.

Reliability refers to the ability to repeat the operations of a study, with the goal of minimizing bias and errors in a study. This threat to validity was addressed through the case study protocol during data collection. In addition, a case study data base (see preliminary analysis, below) was maintained for document coding and theme identification.

Preliminary Qualitative Analysis

Within the case study site, semi-structured qualitative interviews were conducted with key informants. Interview guides were developed to collect qualitative data from key informants, and were related to the interview questions. In addition, key informants were asked to name other relevant actors in the local public health system. This served the purpose of identifying a complete network in the case study site. A second purpose of the semi-structured interviews was to refine the researcher's understanding of the relational dynamics within the local public health system. This in turn assisted in the refinement of questions contained in the organizational survey instrument used in the SNA phase. Direct observations of HIV planning council and committee meetings (and other HIV community forums) were also conducted over 12 months. Field notes were used to assist in identifying relevant themes related to the research questions.

Qualitative data from the semi-structured interviews, archival documents, and direct observation was transcribed and imported into QDA Miner (ver. 4) for coding. A first-level coding category (Miles & Huberman, 1994) was created using the following domains: Acts, Activities, Meanings, Relationships and Settings (see Appendix A, Qualitative Code Set). Additional sub-codes were developed based on the research questions. Codes either represented a relationship type or a pattern category related to the research questions. Relationship codes were recorded, and relational data were transferred to a relationship matrix (Excel) that was used in the SNA phase. Content analysis of qualitative data also revealed patterns related to information system practices, including accountability and performance management processes. Pattern coding (Miles & Huberman, 1994) was developed after the first-level coding described above. Patterns were organized according to the following domains: Accountability, Information System, and Knowledge Management (see Figure 3, Qualitative Themes). The identification of key external events that influenced the evolution of the local network was represented in a Critical Incident Timeline (figure 4). This information detailed the external factors that influenced the evolution of the local system of care over time, and provided explanation of the factors that influenced system integration. The data sources used in the qualitative analysis, as well as the relevant qualitative codes, were cataloged in a research data base for later recall. The overall methodological approach (Table I, Data Analysis Plan) links the specific research questions to data sources, data collection methods, and analytical approaches for each data type. All public health system actors who were interviewed remained anonymous per IRB protocol for protection of human subjects, and all data collected was maintained in either a locked cabinet or secure server.

Table I. Data Analysis Plan

Research Question 1: How do accountability relationships in local interorganizational networks influence information system practices? How does network structure influence how information is shared and used for network-level quality improvement activities?

<i>Applied Research Question</i>	<i>Measures</i>	<i>Data Source</i>	<i>Data Collection Methods</i>	<i>Methods of Data Analysis</i>
How does relational accountability in the local HIV/AIDS network influence the use of information in performance management?	<ul style="list-style-type: none"> • Mandated reporting and QM requirements • Innovation and expansion of QM activities 	<ul style="list-style-type: none"> • Archival documents • HIV Planning Council meetings • Local subject matter experts 	<ul style="list-style-type: none"> • Extracted content • Direct Observation • Semi-structured interviews 	Document coding/pattern extraction
How does network cohesion influence the use of information system practices required for program planning and performance management?	<ul style="list-style-type: none"> • Avg degree, Centralization • Density • Fragmentation • Diameter • Connectedness • Avg distance 	<ul style="list-style-type: none"> • Local subject matter experts • Archival documents • Organizational survey respondents 	<ul style="list-style-type: none"> • Semi-structured interviews • Direct Observation • Network survey 	<ul style="list-style-type: none"> • Document coding/pattern extraction • SNA-macro level: comparison on network cliques

Research Question 2: What are the key environmental factors influencing change in public health network structure? What is the role of the local governmental public health agency within the network in adapting to change?

Research Question 3: How do central actors influence practices and patterns of information exchange in public health networks?

Applied Research Question	Measures	Data Source	Data Collection Methods	Methods of Data Analysis
What are the key external forces driving change in the HIV/AIDS system of care?	<ul style="list-style-type: none"> Changes in federal health policy and regulatory requirements Increases/decreases in federal funding 	<ul style="list-style-type: none"> Archival documents HIV Planning Council meetings Local subject matter experts 	<ul style="list-style-type: none"> Extracted content Direct Observation Semi-structured interviews 	<ul style="list-style-type: none"> Document coding/pattern extraction Critical incident analysis
How have these changes influenced cohesion of the network?	<ul style="list-style-type: none"> Avg degree, Centralization Density Fragmentation Diameter Connectedness Avg distance 	<ul style="list-style-type: none"> Archival documents Organizational survey respondents Local subject matter experts 	<ul style="list-style-type: none"> Extracted relationships Network survey Semi-structured interviews 	<ul style="list-style-type: none"> Document coding/pattern extraction SNA- macro level
How does the local health department influence integration of the HIV/AIDS system of care?	<ul style="list-style-type: none"> Degree Centrality Betweenness Centrality Participation in local planning activities 	<ul style="list-style-type: none"> Archival documents Organizational survey respondents HIV planning council activities 	<ul style="list-style-type: none"> Extracted relationships Network survey Direct Observation 	<ul style="list-style-type: none"> SNA- micro actor level Document coding/pattern extraction

Which organizational relationships are most important in facilitating the application of information and knowledge to system improvements?	<ul style="list-style-type: none"> • Brokerage centrality • Planning council policies and practices 	<ul style="list-style-type: none"> • Archival documents • Organizational respondents • HIV Planning Council meetings • Local subject matter experts 	<ul style="list-style-type: none"> • Extracted relationships • Network Survey • Direct Observation • Semi-structured interviews 	<ul style="list-style-type: none"> • SNA- micro level • Document coding/pattern extraction
How do information system practices enhance network level knowledge management?	<ul style="list-style-type: none"> • Degree Centrality • Betweenness Centrality • Participation in local planning activities 	<ul style="list-style-type: none"> • Archival documents • Organizational survey respondents • HIV planning council activities 	<ul style="list-style-type: none"> • Extracted relationships • Network survey • Direct Observation 	<ul style="list-style-type: none"> • SNA- micro, macro level • Document coding/pattern extraction

Social Network Study Design

Social network analysis (SNA) is a methodological approach in the social sciences that is concerned with the relationships between social actors. A distinction setting SNA apart from other forms of quantitative research is its emphasis on relational data. Individual organizations in a network have measurable attributes related to that organization. In variable analysis, statistical methods are used to describe or predict some outcome over a random sample of actors. In SNA, the focus is on relational data, which are not the properties of individual actors, but systems of actors (Scott, 2007). Although attribute data is commonly used in SNA to explain network structure, the emphasis is on the measures associated with relational data. The emphasis in SNA is on the “structure of social action,” which is addressed through the analysis of relational data (Scott, 2007).

The main proposition informing the SNA in this study was that central actors in public health networks have a key role in assuring accountability for health outcomes within the context of the local public health system as an interorganizational enterprise. A second proposition was that organizational actors that have high centrality are likely to influence the dissemination of data and knowledge across the public health network, and therefore act as key facilitators of network-level learning (Valente, 2010). In addition to quantifying the centrality of key actors, qualitative analysis provided additional insight into the meaning of the roles of central actors as it related to assuring accountability for health outcomes, in managing knowledge across the enterprise, and overall strategic network management.

In addition to the centrality measures of individual actors, “macro” measures provided insights related to the entire system. In this study, measures of network cohesion provided a measure of the overall connectedness of the whole network, which was related to the research question regarding how the network adapted to change. The importance of cohesion in this study was related to the integration of clinical care and prevention programs in HIV.

In this study, the network population was defined as organizations in a local jurisdiction that provided HIV/AIDS primary care and support services, agencies that provided HIV/AIDS prevention services, and agencies that transmitted data to or received data from a local lead agency. Those organizations involved in the delivery of these services or transmission of related clinical data constituted the network actors. The relational data (ties) between these actors were defined as (1) intergovernmental relationships formed by statute or through grant or contract funding mechanisms; (2) communication between clinical service providers through community planning or data exchange; (3) reporting of program outcome data to authorizing stakeholders; (4) reporting of financial or outcome data to non-governmental funders.

Given the presence of several potentially relevant relationships, the network was analyzed as multiplex. Ties between actors were documented as present or absent, whether directed or non-directed. One exception to this is the network graph for accountability/reporting relationships (see Figure 9). In this graph, ties were directed to indicate the reporting relationship. In considering the relationship between federal/state governmental agencies and local public health system actors (the vertical dimension of the federal, intergovernmental system), the accountability/reporting relationships graph was the only one that included federal funding agencies. In all other cases, the focus was on the local network. The network size was expected to consist of 15 to 30 actors. A preliminary set of relationships that was considered included:

- *Relational Accountability*: contracting/subcontracting; mandated reporting relationships; statutory relationships; reporting relationships (funding requirements, program outcomes); vertical and horizontal governance relationships; financial exchange.
- *Interorganizational Relationships*: contracts/sub-contracts, information system reporting relationships, community health planning processes, informal leader-to-leader relationships, service delivery coordination, resource exchange.

- *Information Exchange*: clinical data exchange, program outcomes reporting, communicable disease reporting, laboratory data exchange; administrative information exchange
- *Network Knowledge Management*: coordination of evaluation activities, sharing of evidence-based practice, adjustment to program design or implementation.

Relational data (for social network analysis) was acquired through the process of coding qualitative data from the case study phase of this project. Key informant interviews and archival documents were the primary source of relational data. During the coding process, a subset of codes documented relationships of interest. These relationships were documented on a relationship matrix, and document sources for each relationship were cross-referenced to a qualitative database. Of importance to this process was Part A grant applications for Ryan White funding. Funded agencies were required to document subcontracting and collaborative relationships, and this proved to be a valuable source of data for the SNA. An organizational survey was also delivered to representative organizations of the network, but these data served a confirmatory role, rather than a primary source of relationship documentation. Data from the relationship matrix were converted to a format (DL format) appropriate for importation into SNA software, UCInet, for statistical analysis.

Analysis of relational network data was conducted at the levels of individual actor (micro), cluster/cliue, and whole network (macro). The analysis proceeded as follows:

- **Actor**: Each actor (organization) within the network was analyzed utilizing basic descriptive network statistics, including several measures of centrality. Actor attribute data was also documented for consideration of explanations of clustering within the network. The identification of central actors was the main actor concern in this study. Differences between the local lead agency for HIV/AIDS primary care services and the governmental health agency were also considered.

- **Cluster:** The Ryan White Part A service delivery network was compared with the local HIV prevention network. These network clusters (egocentric networks) were also compared to the entire network as an integrated system of care. Marsden (2005) recognized that egocentric and whole-network are interrelated, and that these analyses are often complementary.
- **Whole Network:** Analysis at the macro scale focused on the clustering of groups and overall cohesion of the network. Specific measures of cohesion included average degree, centralization, density, fragmentation, diameter, connectedness, and average distance. Attribute data was considered to show structural equivalence between groups. Measures of cohesion addressed questions related to integration across clinical care and prevention systems.

An analysis and discussion of the themes emerging from the qualitative case study, combined with the SNA, provided an understanding of the local EMA's "information system." Using Checkland's conceptual model, the discussion (below) provided evidence that supported analytic generalization to network theory (Valente, 2010) regarding the critical role of central actors in information exchange.

Study Design/Implementation Issues

Several limitations to the original research design were identified, and addressed as follows. The first limitation was related to a survey for respondents to answer on behalf of their organization. There was some difficulty in obtaining an email distribution list from the Part A Grantee office. A list was obtained from the Part B consortium, and this contained contact information for many of the Part A agencies. The survey was sent out on three separate occasions, but the response rate was very low. Thus, agencies were contacted directly and the survey was administered directly over the phone, with

answers being recorded by the researcher. Response data from the survey questionnaires was transferred to the Relationship Matrix. There was no instance where relational data from the surveys was not corroborated by data from archival documents. Archival documents, in particular the Part A grant applications, proved to be a more robust source of data to verify relationships between organizations. Some organizations who had been initially included in the network were excluded after it was determined that their participation was peripheral to the study questions being addressed. These were organizations that received funding (passed through the Broward Regional Health Planning Council) for HIV prevention projects from the Community Foundation of Broward. These prevention efforts were not closely coordinated with the biomedical prevention efforts organized by the Florida Department of Health, and they were not involved in any significant way in other aspects of HIV planning or service delivery.

A second change to the research design involved aggregating or eliminating some codes from the code set. For example, the original code set had two codes for data exchange; direct and indirect. These were combined for the purposes of documenting the exchange of data between organizations. While there were organizations in the network that transmitted clinical data electronically through the Grantee's data management system, the exchange of data in summary form more often occurs in the form of reports. The aggregation of these two codes allowed for a data exchange relationship to be recorded on the Relationship Matrix and to then be represented in a single network map. Other codes were eliminated as they were discovered to be less relevant.

What the research limitations revealed was a general limitation of survey design in SNA. In SNA, survey data can be a quick and unobtrusive means to collect data *if the respondents are knowledgeable of social network concepts and are familiar with the focus of the study*. If the researcher is not well-known to the respondents, or respondents are not familiar with network studies, the response rate will likely suffer. To overcome these limitations, the researcher would likely need to become more

embedded in the case study site. In this case, the decision to become embedded was a departure from the original research design, but it proved to be useful to gain knowledge of the local context that would not have been available with a more outside approach.

Chapter IV. Research Results

The goal of the research was to investigate an exemplar case of a local public health system to identify best practices in knowledge management, coordinated service delivery, and strategic network management across the multiple organizations responsible for health outcomes. The specific context being investigated was an HIV/AIDS system of care in Broward County, Florida. The specific research questions being addressed were:

1. How do accountability relationships in local interorganizational networks influence information system practices? How does network structure influence how information is shared and used for network-level quality improvement activities?
 - a. How does relational accountability in the local HIV/AIDS network influence the use of information in performance management? How does network cohesion influence the use of information system practices required for program planning and performance management?
2. What are the key environmental factors influencing change in public health network structure? What is the role of the local governmental public health agency within the network in adapting to change?
 - a. What are the key external forces driving change in the HIV/AIDS system of care? How have these changes influenced cohesion of the network? How does the local health department influence integration of the HIV/AIDS system of care?
3. How do central actors influence practices and patterns of information exchange in public health networks?
 - a. Which organizational relationships are most important in facilitating the application of information and knowledge to system improvements? How do information exchange practices enhance network level knowledge management?

The study design involved the collection of relational data for organizations in the network, archival data that provided information related to the research questions (and further documented organizational relationships), direct field observations, and individual responses from a social network survey instrument. The results presented below incorporate themes derived from qualitative data analysis, statistical measures from social network data, and sociograms (social network maps) generated from social network data. After presentation of the research findings, a Discussion and Conclusion is presented.

Qualitative Results

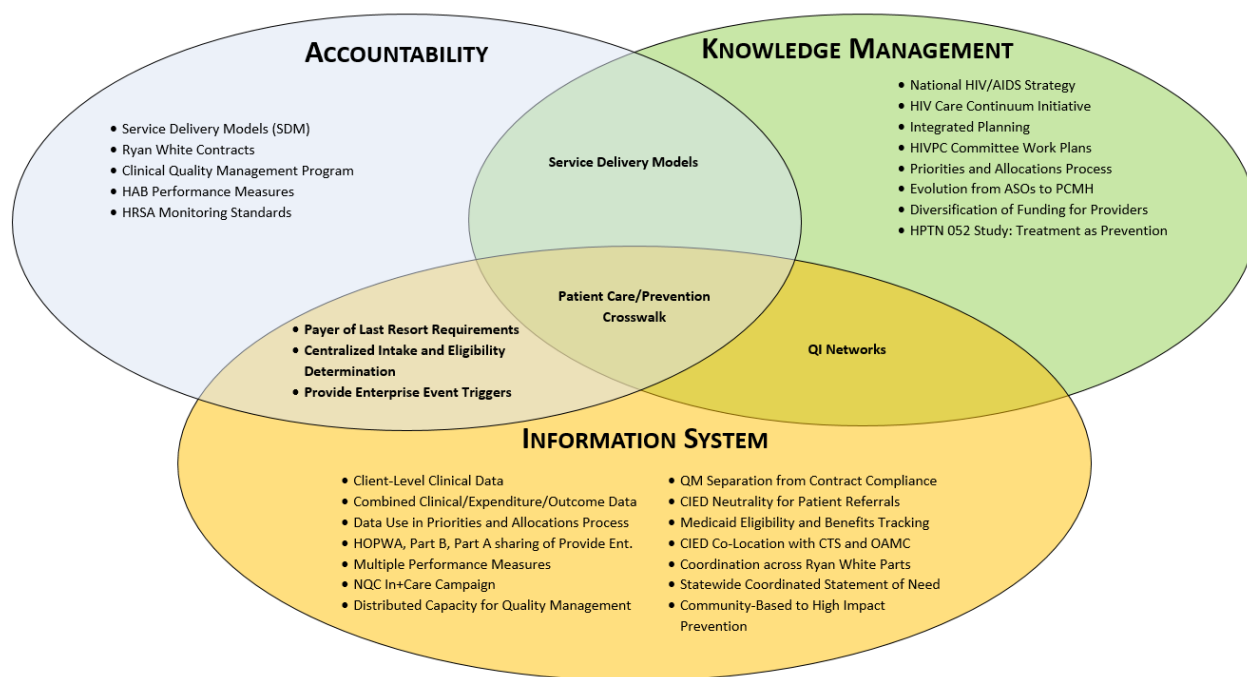
For the qualitative phase of the research, data was collected by key informant interviews, field observations and archival documents. The qualitative analysis was completed using the software QDAMiner, version 4. Archival documents were collected over a period of 12 months and included meeting minutes and supporting documentation from the local HIV planning council, HRSA reports specific to the EMA and the Florida ADAP program, Part A grant application documents submitted by local agencies as part of an RFP process, and other publicly available documents downloaded from the internet. Interview transcripts and archival documents were analyzed utilizing the code set contained in Appendix A.

After all archival documents and transcribed interviews were uploaded into QDAMiner, the software was used to map codes from the coding list to the documents. Codes were assigned to text fragments to (1) document relationships between organizations, and (2) identify themes related to the research questions. The first stage of the coding process was to identify and document relationships between organizations. A relationship was established based on (1) evidence of an existing contract or Memorandum of Understanding between two organizations; (2) referral relationships; (3) joint participation community planning meetings; (4) direct exchange of clinical data; or (4) a reporting relationship. These relationships were entered into an Excel matrix, with hyperlinks for individual

relationships to the qualitative source database. The Excel data was then converted into DL format and exported to UCINet for SNA.

The second stage of the qualitative analysis involved the identification of themes related to the research questions. Following techniques outlined by Miles & Huberman (1994) for building data displays from qualitative data, an initial interpretation of themes was developed. Themes were then aggregated and analyzed to identify trends in the overall data. Themes were grouped into three domains: Information System, Accountability, and Knowledge Management. These themes were assembled into a Venn diagram (matrix display) that displays the inter-relationships of the documented themes (see Discussion section).

Figure 3. Qualitative Themes



A second set of themes were temporal in nature, and related to historical factors that influenced the current configuration of the network. Events were then displayed in a Critical Incident Timeline. This diagram illustrated the historical context of the case.

Figure 4. Critical Incident Timeline



Social Network Analysis Results

Social network analysis (SNA) involved the collection of relational data across a set of actors in the network. Actors in this case were organizations that comprised the local public health system- the Broward County, Florida HIV/AIDS system of care (SOC). In network maps, organizations were represented by nodes, and the relationship of interest was represented by a line (edge) between one or more nodes. Each organizational relationship (dyad) was considered for a number of different possible relationship types. These included exchange of funding, referral relationships, data exchange, and shared participation in a planning process. In this case, network data was collected by (1) review of archival documents, and (2) a social network survey disseminated to actors in the network. All relationships were documented on a Relationship Matrix using Microsoft Excel. For each relationship

type, Excel data was transformed into a format (DL, data language) readable by SNA software, UCInet. Analytic measures were generated in UCI net and are presented below. In addition to the relational statistics, UCInet also generated network maps for visualization of the relationships of interest.

There were two analytical frames relevant to the research question. The first frame used *micro* measures related to the influence of individual organizations within the larger network. These were *centrality* measures, and they helped address questions related to the influence of organizations as information brokers or as a key point of linkage between network cliques. A second set of *macro* measures addressed the network as a whole. In this case, cohesion measures helped address questions related to the connectedness of the network (or network subset) across different relationship types. Tables II and III contain micro-level centrality data. Table II presents degree, betweenness and brokerage centrality statistics for all actors in the HIV Treatment and the Integrated HIV Treatment/Prevention Network. By comparing organizational centrality across these two networks, evidence was generated that showed the differing roles of central organizations across relationship types (see Discussion below). Table III presents centrality statistics for a smaller subset of actors, and adds the Data Exchange Network statistics for organizational centrality. Since a smaller number of actors in the network were involved in the electronic exchange of clinical patient data, this resulted in a narrower set of actors for the subsequent analysis. Table IV presents macro-level cohesion measures for all networks studied.

During the research design and data collection phases, the following relationship types were quantified: (1) organizations that shared participation in treatment service planning; (2) organizations that shared participation in prevention planning; (3) organizations that exchanged clinical or administrative data; and (4) organizations that had reporting responsibilities to federal funders or local lead agencies.

Network maps (sociograms) are presented below, and provide a visualization of the networks described above. Figures 5 and 6 represent the HIV Treatment and HIV Prevention networks,

respectively. Figure 7 represents the integrated HIV Treatment/Prevention network. Figure 8 represents the network of organizations that exchange client-level clinical data, and Figure 9 represents the reporting relationships within the network. Figure 9 is the only network diagram with directed ties. In this diagram, the direction of the arrows represents the direction of the reporting relationship. For all network diagrams, the shape of the node represents the organizational type, and the color of the node represents the funding source for that agency.

Table II. Centrality Comparison HIV Treatment vs. Integrated Treatment/Prevention Network, Broward County, FL

	<i>HIV Treatment Network</i>			<i>Integrated HIV Treatment/Prevention</i>		
	<i>Degree</i>	<i>Betweenness</i>	<i>Brokerage</i>	<i>Degree</i>	<i>Betweenness</i>	<i>Brokerage</i>
ACS	1	0.00	0	1	0.00	0
AETC	1	0.00	0	1	0.00	0
AHF	6	29.08	9	6	22.46	14
BCFHC	2	0.00	0	3	0.00	0
BCHD	8	43.48	16	19	224.44	288
BCHS	18	182.17	49	18	142.85	240
BH	4	0.00	1	5	0.25	0
BPH	2	2.50	0	2	1.67	2
BRHPC	13	81.75	105	18	158.45	242
BSO	3	27.00	3	3	33.00	4
BhSE	6	25.35	11	7	31.82	24
CAC	1	0.00	0	1	0.00	0
CDTC	3	0.67	2	4	0.00	0
CFL	10	121.16	12	10	144.78	76
CR	4	4.19	1	4	11.17	2
FDOH	5	7.87	8	7	11.28	16
GTI	2	0.00	0	3	0.00	0
HCH	1	0.00	0	2	0.00	0
HCSF	3	2.86	3	3	1.81	5
HOH	1	0.00	0	1	0.00	0
LASBC	2	0.00	0	2	0.00	0
MDEI	2	0.00	0	4	0.00	0
MH	2	0.00	0	3	0.00	0
MODC	1	0.00	0	1	0.00	0
NSU	2	5.59	0	3	10.46	0
Pctr	2	0.00	1	2	0.00	0
SBA	1	0.00	0	1	0.00	0
SHD	1	0.00	0	1	0.00	0
WC	3	3.33	2	3	4.61	4

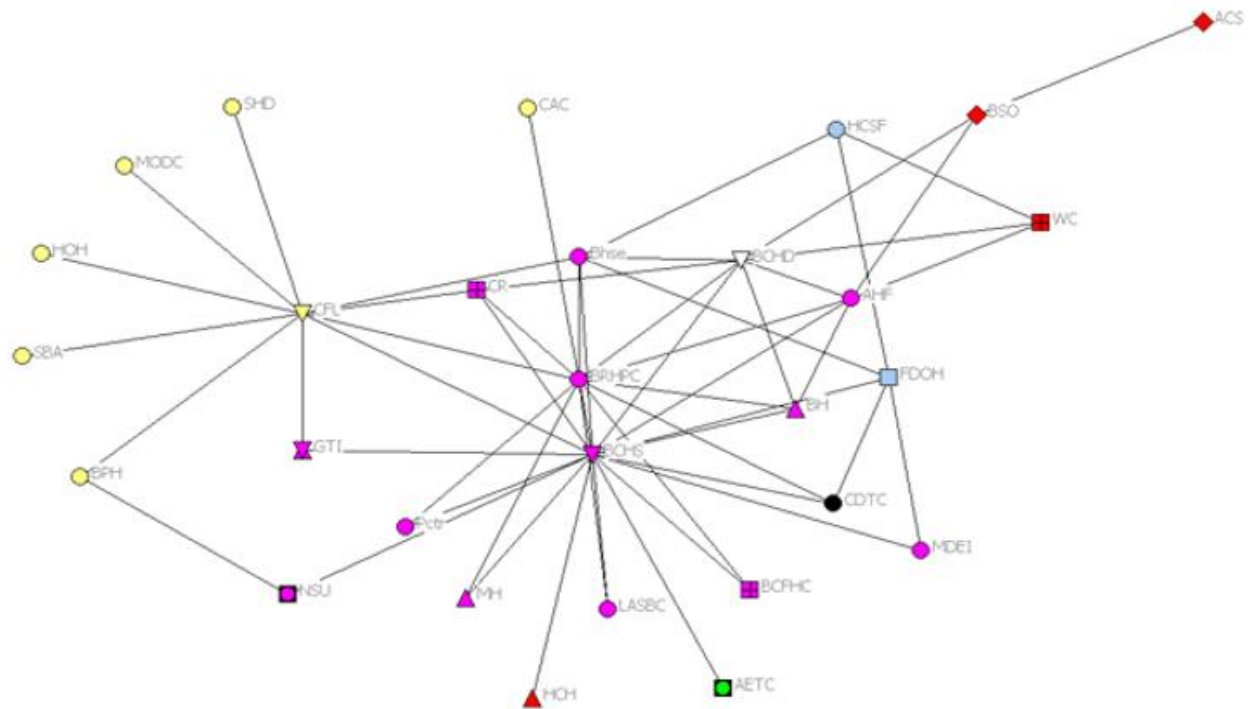
Table 1. Centrality in HIV Treatment, Prevention and Data Exchange Networks, Broward County, FL

	<i>HIV Treatment Network</i>		<i>HIV Prevention Planning</i>		<i>Data Exchange</i>	
	<i>Degree</i>	<i>Betweenness</i>	<i>Degree</i>	<i>Betweenness</i>	<i>Degree</i>	<i>Betweenness</i>
AHF	6	29.079	1	0	2	0
BCFHC	2	0	1	0	1	0
BCHD	8	43.479	18	184	3	0
BCHS	18	182.173	2	0	18	77.5
BH	4	0	1	0	3	0
BRHPC	13	81.751	4	37	19	93.5
BhSE	6	25.351	1	0	3	0
CDTC	3	0.667	1	0	1	0
CR	4	4.192	1	0	2	0
FDOH	5	7.867	1	0	3	0
MDEI	2	0	1	0	2	0
MH	2	0	1	0	2	0

Table IV. Network Cohesion in HIV Services Networks, Broward County, FL

	<i>HIV Treatment Services</i>	<i>HIV Prevention Planning</i>	<i>Integrated Treatment/ Data Exchange</i>	<i>Compliance Reporting</i>
Avg Degree	2.97	1.10	3.17	2.33
Centralization	0.37	0.15	0.33	0.15
Density	0.11	0.06	0.09	0.12
Fragmentation	0.30	0.75	0.39	0.81
Diameter	5.00	3.00	5.00	3.00
Connectedness	0.35	0.25	0.61	0.19
Avg Distance	2.39	2.08	2.38	2.15

Figure 5. HIV Treatment Network, Broward County, Florida



















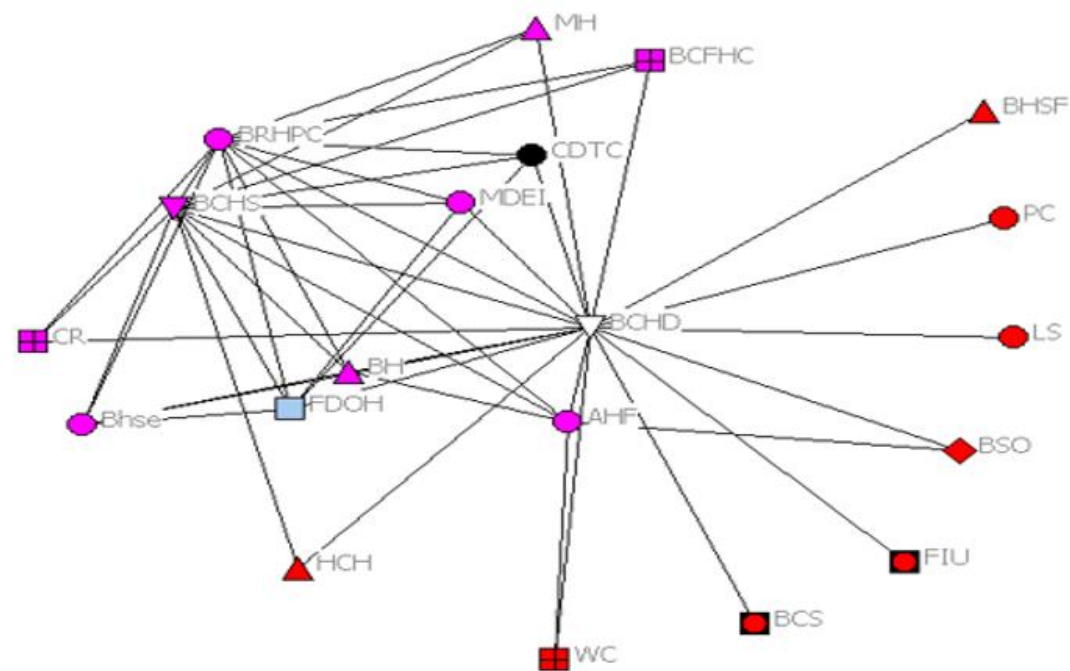
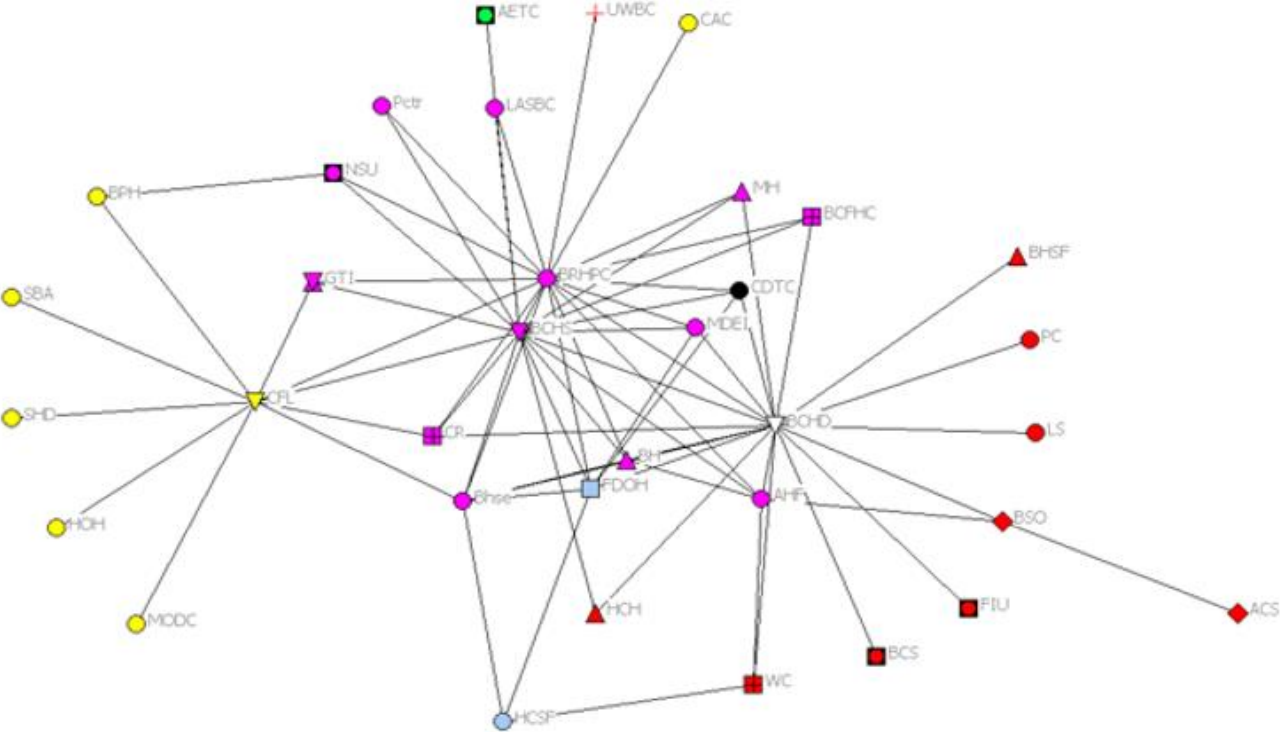
ORGANIZATION TYPE		FUNDING SOURCE	
	Local Funder		Ryan White Part A
	State Government		Ryan White Part B
	Nonprofit		Ryan White Part A/B
	Local Government		HOPWA
	Healthcare		Ryan White Part C
	Law Enforcement		CDC/FDOH Prevention
	FQHC		Ryan White Part F
	Education		
	IT/Consulting		

Figure 6. HIV Prevention Network, Broward County, Florida



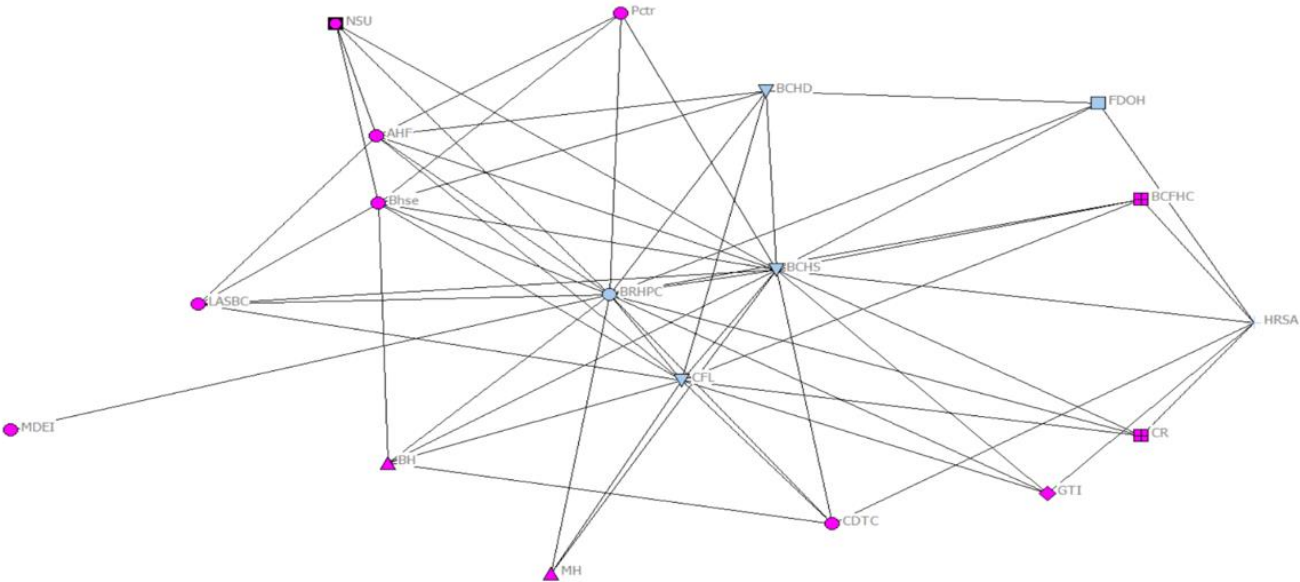
ORGANIZATION TYPE	FUNDING SOURCE
Local Funder	Ryan White Part A
State Government	Ryan White Part B
Nonprofit	Ryan White Part A/B
Local Government	HOPWA
Healthcare	Ryan White Part C
Law Enforcement	CDC/FDOH Prevention
FQHC	Ryan White Part F
Education	
IT/Consulting	

Figure 7. Integrated HIV Treatment/Prevention Network, Broward County, Florida



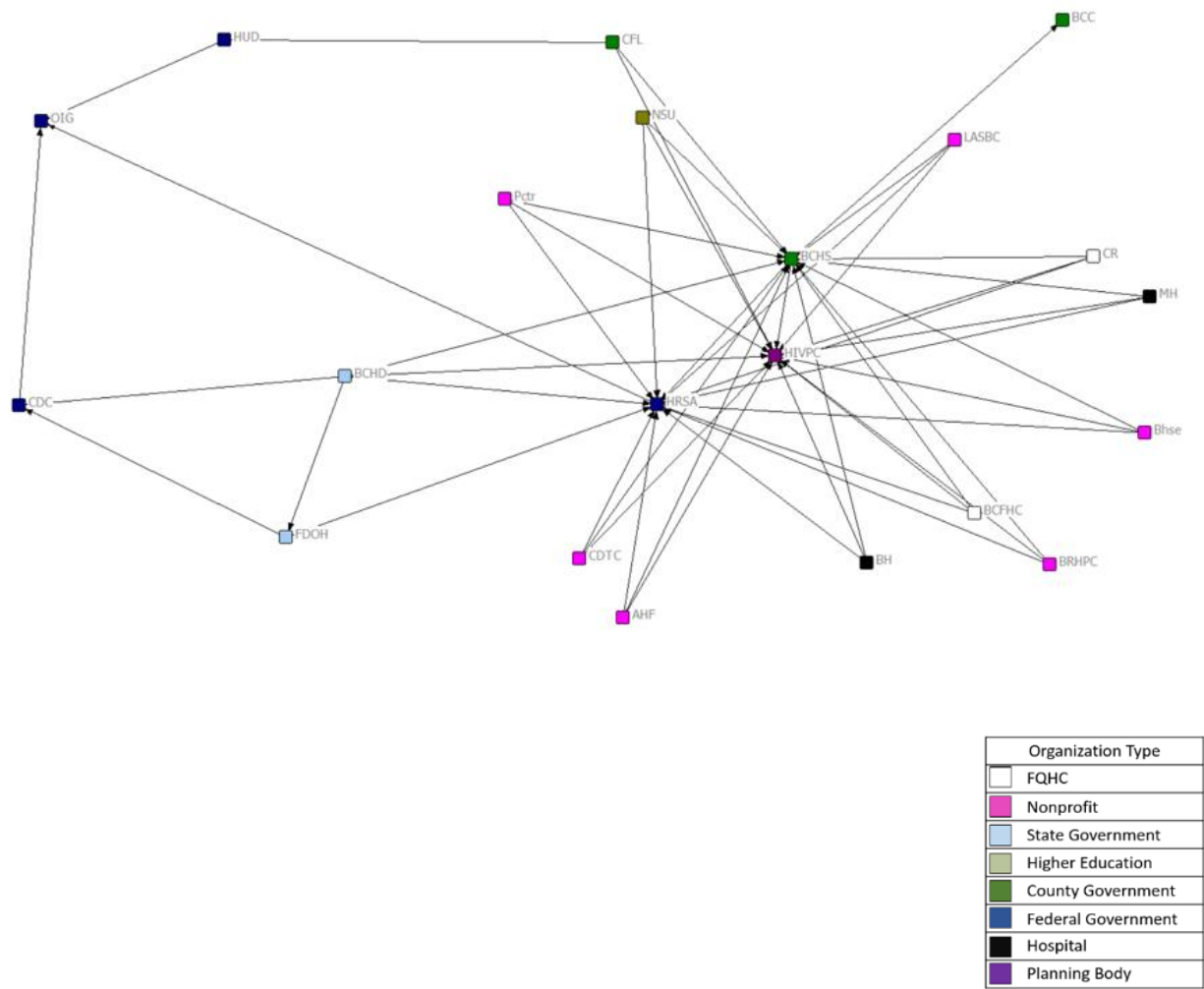
ORGANIZATION TYPE		FUNDING SOURCE	
+	Local Funder		Ryan White Part A
□	State Government		Ryan White Part B
○	Nonprofit		Ryan White Part A/B
▽	Local Government		HOPWA
△	Healthcare		Ryan White Part C
◇	Law Enforcement		CDC/FDOH Prevention
⊞	FQHC		Ryan White Part F
⊙	Education		
⊗	IT/Consulting		

Figure 8. Ryan White Clinical Data Exchange Network, Broward County, FL



ORGANIZATION TYPE		FUNDING SOURCE	
+	Federal Funder	■	Sub-Recipient
□	State Government	■	Funder
○	Nonprofit		
▽	Local Government		
△	Healthcare		
◇	Law Enforcement		
▣	FQHC		
●	Education		
⊠	IT/Consulting		

Figure 9. HIV/AIDS Reporting Relationships, Broward County, FL



Chapter V. Discussion and Conclusions

Conclusions are discussed below, and are presented relative to the specific research questions presented in the study design. Conclusions are presented in a manner that provides insights and distinctions between the micro and macro-scale of network context. Lastly, general conclusions related to strategic network management and mutual accountability for the outcomes produced by the local system of care are discussed, with specific recommendations for local actors in the Broward EMA.

Research conclusions and recommendations are presented below, Table V:

Table V. Research Conclusions and Recommendations

Research Question 1	Measures	Evidence	Results	Conclusions	Leadership Implications/Recommendations
<i>How do accountability relationships in the local HIV/AIDS network influence the use of information in performance management?</i>	Patterns in qualitative data identified through coding and pattern recognition.	Direct observation, archival documents, and key stakeholder interviews provided qualitative evidence to support conclusions.	<ul style="list-style-type: none"> The use of a robust menu of health indicators, tied to data available in the information system, was a key enabling factor that supported the work of quality management committees. Tying contract reimbursement to eligibility and viral load data in the information system was a critical factor in assuring accountability. The combination of fiscal, clinical, utilization, quality, and health outcome data provided key capacity that supported local performance management. 	<ul style="list-style-type: none"> Formal contracts represented the primary mechanism establishing relational accountability within the local network Federal monitoring standards resulted in more stringent local contract standards applied at the local level. Program reporting requirements defined primary relationship patterns of data and information sharing within the local network. The combination of fiscal, utilization, quality and health outcomes data was a key factor in the EMA's ability to effectively facilitate performance management. The key method that assured accountability of network actors to program standards was the linking of contract reimbursement to eligibility and local service delivery standards in the data management system 	<ul style="list-style-type: none"> Patient care providers should receive ongoing training in the effective use of data to improve quality and health outcomes for Part A services The BRHPC and BCHS should work with BCHD to develop a performance management and evaluation system for HIV prevention programs The HIVPC should develop specific outreach and education for non-aligned consumers to increase skills to use data to support priorities and resource allocations decisions.
<i>How does network cohesion influence the use of information system practices required for program planning and performance management?</i>	<p>Network cohesion</p> <p>Patterns in qualitative data identified through coding and pattern recognition.</p>	<p>Relational data/Relational Data Matrix</p> <p>Direct observation, archival documents, and key stakeholder interviews provided qualitative evidence to support conclusions.</p>	<p>Higher measures of cohesion for the HIV treatment network versus the HIV prevention network.</p> <p>The use of an expanded portfolio of health outcome measures in the performance management framework influenced service integration.</p>	Information system practices varied significantly between the HIV patient care (Part A) and HIV prevention networks. Greater transparency and sharing of data in the HIV patient care network resulted in more greater cohesion in the patient care network.	BCHD should work with BRHPC and other stakeholders to develop a transparent performance management system for HIV prevention programs. Data sharing agreements should be put in place to allow for the sharing of data between prevention and patient care programs.

Research Question 2	Measures	Evidence	Results	Conclusions	Leadership Implications/Recommendations
<i>What are the key external forces driving change in the HIV/AIDS system of care?</i>	Patterns in qualitative data identified through coding and pattern recognition.	Archival documents, key stakeholder interviews and direct observation	<ul style="list-style-type: none"> Increasing administrative requirements lead to consolidation of smaller ASOs and fiscal diversification in key organizations. The ACA presented barriers to the efforts of smaller ASOs to diversify funding sources. 	<ul style="list-style-type: none"> A major external driver of change in Broward County involved the evolution of federal regulatory standards, which influenced the consolidation of services within the local service delivery network. The passage of the Patient Protection and Affordable Care Act (ACA) contributed to consolidation in the local network. 	<ul style="list-style-type: none"> The HIVPC should provide ongoing education to Ryan White agencies to assure that all stakeholders are fully aware of emerging federal requirements. Enrollment patterns of clients in ACA plans should be closely monitored to prevent disruption in medical services.
<i>How have these changes influenced cohesion of the network?</i>	Patterns in qualitative data identified through coding and pattern recognition.	Direct observation, key informant interviews and archival documents.	<ul style="list-style-type: none"> The NHAS lead to integration between patient care and prevention networks Requirements for local prevention and patient care programs to integrated local comprehensive plans. These requirements were driven by the adoption of the “treatment as prevention” paradigm, which was the result of the HPTN research study linking viral suppression to halting the transmission of HIV. 	<ul style="list-style-type: none"> The adoption of the National HIV/AIDS Strategy, informed by “treatment as prevention” as an organizing paradigm led to further integration of prevention and treatment programs. CDC community planning requirements under HIP influenced the process of local integration of patient care and prevention networks. 	<ul style="list-style-type: none"> BCHD, NRHPC, and BCHS should maintain an integrated planning process that links HIV patient care and prevention programs. BCHD, NRHPC, and BCHS should maintain an integrated planning process that links HIV patient care and prevention programs.
<i>How does the local health department influence integration of the HIV/AIDS system of care?</i>	<p>Network measures of organizational centrality</p> <p>Patterns in qualitative data identified through coding and pattern recognition.</p>	<p>Relational data/Relational Data Matrix</p> <p>Direct observation, key informant interviews, and archival documents</p>	<ul style="list-style-type: none"> Higher centrality for BCHD in the prevention network vs. patient care network The FDOH central office caused the local health department to abandon the direct provision of clinical services. This resulted in decreased influence in the treatment network. 	<ul style="list-style-type: none"> BCHD had a greater influence in the HIV prevention network than in the HIV treatment network. Political priorities at the state level mediated the influence of BCHD in the local network. The ability of BCHD to exercise local strategic network leadership will likely be influenced by managerial control exercised by the central office of FDOH. 	BCHD should work with BRHPC and other stakeholders to develop a transparent performance management system for HIV prevention programs. BCHD leadership should determine appropriate strategy to facilitate the local office’s ability to provide local leadership to support accountability and transparency in local prevention programs.

Research Question 3	Measures	Evidence	Results	Conclusions	Leadership Implications/ Recommendations
<i>Which organizational relationships are most important in facilitating the application of information and knowledge to system improvements?</i>	<p>Network measures of organizational centrality</p> <p>Patterns in qualitative data identified through coding and pattern recognition.</p>	<p>Relational data/Relational Data Matrix</p> <p>Direct observation, key informant interviews, and archival documents</p>	<ul style="list-style-type: none"> • Betweenness centrality measures for BCHD confirmed that organizations brokerage role between patient care and prevention organizations. • The importance of the BRHPC-BCHS relationship related to CIED, CQM, and HIVPC support. • Archival documents and network measures provided evidence of the brokerage role of BCHD between the local network and FDOH. 	<ul style="list-style-type: none"> • The relationships between BRHPC, BCHS and BCHD were the most important in facilitating the integration of services between patient care and prevention, and between the Part A and Part B programs. • BCHD served as a critical linking organization between the HIV patient care and HIV prevention networks. • The administrative management of client-level viral load data by both BRHPC and BCHS facilitated network-level knowledge management practices. 	<p>BCHD should provide local leadership to support greater transparency in data sharing between prevention and patient care programs. BCHD should consider using the HIVPC committee structure to develop a performance management system for prevention programs</p>
<i>How do information exchange practices enhance network level knowledge management?</i>	<p>Patterns in qualitative data identified through coding and pattern recognition.</p>	<p>Direct observation, key informant interviews, and archival documents</p>	<p>The use of client level clinical and expenditure data drove performance management. The HIVPC committee structure was a key infrastructure supporting network level knowledge management.</p>	<ul style="list-style-type: none"> • The EMA combined financial, utilization, quality and health outcomes data to drive accountability and quality improvement processes. <p>Data sharing and service integration across CDC and HRSA programs at the local level was supported by a committee structure in the HIV Planning Council that resulted in effective knowledge management across the network.</p>	<p>BRHPC, BCHS and the HIVPC should develop a knowledge repository that is accessible to Ryan White clients. Clients should be offered training and support to become active users of data in decision making.</p>

Research Question 1

How do accountability relationships in local interorganizational networks influence information system practices? How does network structure influence how information is shared and used for network-level quality improvement activities?

- A) How do accountability relationships in the local network influence the use of information in performance management?

Formal contracts represented the primary mechanism establishing relational accountability within the local network: The term “accountability relationships” refers to the specific arrangements made between network actors that define the contours of behavior and action of individual actors. These arrangements can be formal (contractual requirements, conditions of grant award, etc.) or informal (information exchange, sharing best practices). Relational accountability can be described at the micro-scale (actor-to-actor) or the macro scale (system of care-to-authorizing entity). Finally, relational accountability is considered in the context of qualitative themes identified in the analysis phase. Figure 3 introduces qualitative themes identified during the analysis phase of this project. Themes were grouped across three domains: Accountability, Knowledge Management, and Information System. Sub-themes were presented under each domain, and themes that were cross-cutting over two domains were also represented in the Venn diagram. In the Accountability domain, contractual relationships between Ryan White Part A agencies represented the primary mechanism establishing relational accountability. This formal, micro-scale mechanism was represented by Part A funding contracts between Broward County and Part A service providers. In this case, the Broward County Department of Human Services (BCHS) was the Grantee of record. HRSA funded the County Executive (Broward Board of County Commissioners), who then designated BCHS as the Grantee. BCHS established contracts with Part A service providers through a Request for Proposals process. In addition to funding direct core medical

and support services, BCHS also contracted using administrative funds for additional consulting support, data system management, and Clinical Quality Management (CQM).

Federal monitoring standards resulted in more stringent local contract standards applied at the local level: Relational accountability also involved macro-scale mechanisms. For example, HRSA monitoring standards defined the scope of services for each individual service category that was contracted by a Grantee to local Part A service providers. The HRSA monitoring standards were implemented in 2012 after an HHS Office of Inspector General report on HRSA's practices of monitoring sub-grantees generated findings related to the effectiveness of the federal monitoring process. The resulting monitoring standards demonstrated how performance review at the federal level resulted in more stringent standards applied at the local level. The HRSA monitoring standards included program, fiscal, and universal standards, and they formalized the rules for Part A programs related to allowable program activities and expenditures. The development of federal monitoring standards, along with local contractual mechanisms, illustrated how relational accountability operates at both micro and macro scale. The mandated reporting relationships that were created through these accountability mechanisms in turn influenced the transfer of data and sharing of knowledge within the local network.

Program reporting requirements defined primary relationship patterns of data and information sharing within the local network: An additional macro-scale accountability mechanism in the Accountability domain involved the local network's federal reporting requirements, as well as reporting requirements established by local contracts. The use of HRSA's HIV/AIDS Bureau (HAB) Performance Measures represented the primary framework for establishing the effectiveness of local programs. Through the work of the HIV planning council's (HIVPC) Quality Management Committee (QMC), the HAB measures were established for each funded service category. The QMC was responsible for creating Service Delivery Models (SDMs) for each service category. Each agency was evaluated for each service category for adherence to the SDMs, and for outcomes as defined by the HAB performance measures. In

addition to the HAB performance measures, the Broward EMA evaluated SDMs based on additional measurement frameworks. These included the National Quality Center's (NQC) In+Care Campaign measures, and locally-developed Clinical Quality Management indicators (see Appendix C).

The combination of fiscal, utilization, quality and health outcomes data was a key factor in the EMA's ability to effectively facilitate performance management: The local performance management framework brought together expenditure, utilization, quality, and health outcomes data into a comprehensive report that was used by the HIVPC in its priorities and allocations process. The Part A program and the Broward EMA illustrated how accountability processes and measures at the federal level were implemented in local programs, how these were translated into local accountability processes within the system of care, and how the establishment of this accountability framework influenced the configuration and behavior of the local network. The information system practice of combining fiscal and utilization data with an expanded menu of health outcomes data was a key factor in the EMA's ability to effectively drive performance improvements. This linking of client-level clinical data with administrative (fiscal, service utilization) data provided a key capacity of the network to stratify outcomes analysis by agency, geography, and client demographics. Thus, the network measured cost, efficiency and health outcomes across a variety of outcome measures. The adoption of an expanded menu of performance measures was an indication of the capacity of the local network to use data and information to drive improvements in the performance of individual agencies and of the network as a whole.

The key method that assured accountability of network actors to program standards was the linking of contract reimbursement to eligibility and local service delivery standards in the data management system: Agencies were evaluated based on service utilization, expenditure data, and clinical outcome measures. Agencies and service categories that did not meet performance objectives were subject to funding sweeps. These decisions were managed through the Priorities and Allocations

(P&A) process. The P&A committee of the HIVPC used information from the QM committee and the Grantee to evaluate service category-level outcomes, service utilization, and fiscal performance. Based on these analyses, the committee made recommendations to the Grantee and HIVPC for funding sweeps. Once the HIVPC forwarded these recommendations to the Grantee, the Grantee was responsible for implementing the recommendations through the contract mechanism with individual agencies. What this model demonstrated was how federal requirements in the Knowledge Management domain were tied to accountability processes within the planning councils (QM and P&A), which in turn were tied to accountability processes in the Accountability domain.

In the Information System domain, an important approach to assuring accountability for health outcomes was through IT system controls, which in turn were based on federal requirements that Part A funds were verified as the “payer of last resort” for HIV care in the EMA. The payer of last resort requirements meant that the Grantee and provider agencies were required to verify and document that clients did not have another available payer source, such as private insurance, Medicaid, Veterans Administration, or payment assistance programs for medications, etc. There were two ways in which the Broward EMA’s information system assured that the payer of last resort requirements were met. The first accountability mechanism was a system of Centralized Intake and Eligibility Determination (CIED). BRHPC was contracted by the Grantee to manage the CIED system. This involved a staff of eligibility specialists that were placed geographically throughout the system of care to work with newly-identified PLWHA to establish eligibility for Part A services. These staff were co-located with Part A service providers, hospital discharge staff, and often in private homes. The EMA’s data management system, Provide Enterprise (PE, Groupware Technologies, Inc.) provided internal controls and notifications to maintain client eligibility and assure that only eligible clients received Part A services. One way in which PE accomplished this was with an electronic verification of Medicaid eligibility. The PE system performed a nightly check with Florida Medicaid for existing Ryan White clients, and as Medicaid benefits were

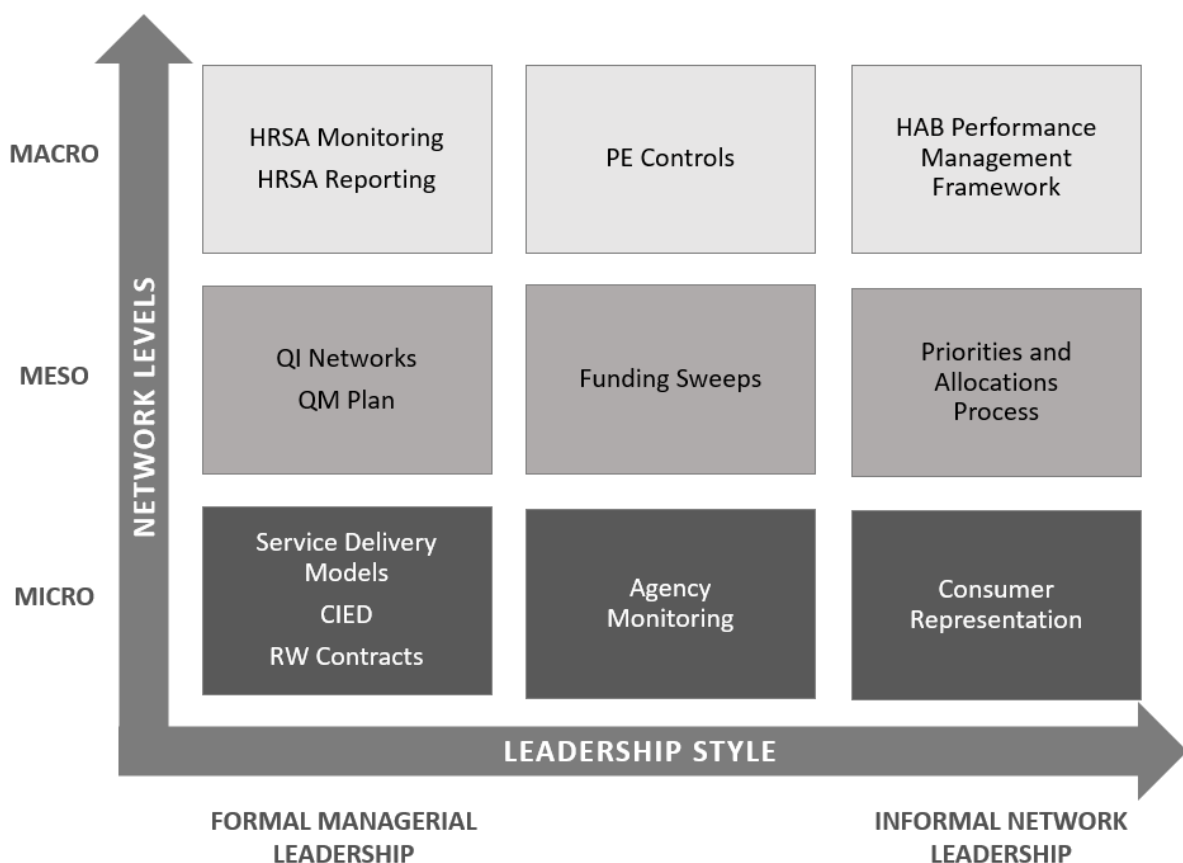
verified, Part A service providers verified which services should be covered by Medicaid rather than Part A. Eligibility for services was further defined in PE where income limitations for individual services were applied, or where third-party insurance coverage rendered clients ineligible for medical services. A second mechanism involved a system of internal controls and triggers within PE that alerted case managers and eligibility specialists when clients were due for eligibility recertification. As the six-month recertification deadline approached, flags were generated in the client profile, alerting any service provider that that client's eligibility was expiring. Once eligibility expired, service providers were notified that the client was ineligible for that service, and that the agency would not be reimbursed for the service.

For the Part A agency, the key method that assured accountability to program standards was tied to the reimbursement process. Agencies in the Broward EMA generated reimbursement requests directly through PE. When the agency printed their monthly reimbursement request, only eligible services were calculated towards the reimbursement total. If an agency provided ineligible services, PE would not add these into the reimbursement request total. Agencies were thus given a financial incentive, through PE, to assure that client eligibility was maintained and documented in the data management system. PE also tracked health outcomes for each agency, and for each funded service category within the agency. PE compared agency expenditure to service utilization to health outcomes using client level data. The system was queried to analyze utilization and outcome data based on client demographics, geography, or risk factor. Each level of analysis was in turn tied to health outcomes. The PE system notified case managers when clients missed medical appointments, were at-risk to falling out of care, had changes in viral loads, or become ineligible for services. The key accountability process was that the information system tied client eligibility, agency reimbursement, and health outcomes in a comprehensive accountability system.

Figure 11 (below) categorized accountability mechanisms in use in the EMA according to the

level of the network in which they were applied. At the micro level, Service Delivery Models, Centralized Intake and Eligibility Determination, and Ryan White agency contracts were the mechanisms that defined requirements for individual clients and organizations. At the meso-level, organizations were held accountable to each other within the network by the EMA's Quality Management Plan, and by the process of quality outcomes review that took place in the Quality Improvement Committees. And at the macro-level, HRSA monitoring standards and reporting requirements represented the mechanisms by which the EMA maintained compliance with federal requirements. The Accountability Matrix also described the leadership and management styles most appropriate for the accountability process. For those described above, a managerialist leadership style was considered most appropriate. Moving across the leadership continuum, the required leadership style became more about dialogue and persuasion.

Figure 10. Accountability Matrix



Recommendations

- Part A service providers should receive ongoing training in the use of client- level fiscal, utilization, and health outcome data to improve agency-level performance outcomes. While BCHS and BRHPC demonstrate adequate capacity to generate measures on behalf of provider organizations, the ability of individual organization to use the data management system to self-monitor efficiency and health outcomes data could provide greater capacity to identify changes in service delivery or quality of care patterns earlier.
- The BRHPC and BCHS should work with BCHD to develop a performance management and evaluation system for HIV prevention programs. The Part A patient care performance management framework provided a data-driven decision support system that could be modified to support the HIV prevention network. While technically feasible, a greater challenge will be to persuade BCHD (and by inference the central FDOH office) to commit to data and information sharing, as well as transparent decision-making processes. In the Part A planning council (HIVPC) process, performance metrics of individual agencies are incorporated into the Priorities and Allocations process. Since the HIV prevention network does not currently employ similar practices, such a process change would be particularly challenging.
- The HIVPC should develop specific outreach and education for non-aligned consumers to increase skills in using data to support priorities and resource allocations decisions. Non-aligned consumers represent 1/3 of planning council membership, and as Part A clients, are living at or below 400% of the Federal Poverty Level. In many cases, these members lack the educational opportunities that professionally-trained members have. Providing additional focused opportunities for these members should result in improved decision making on the planning council.

- B) How does network cohesion influence the use of information system practices required for program planning and performance management?

Information system practices varied significantly between the HIV patient care (Part A) and HIV prevention networks. Greater transparency and sharing of data in the HIV patient care network resulted in greater cohesion in the patient care network: Cohesion measures for whole networks (macro scale) provided data was used to compare the relative “connectedness” of different network cliques. These measures included: average degree, centralization, density, fragmentation, diameter, connectedness, and average distance (see literature review for further discussion). In this study, two network cliques of interest were the HIV treatment network (see figure 5) and the HIV prevention network (see figure 6). Comparison of the scores for these two networks indicated that the HIV treatment network had higher scores on all cohesion measures (see Table IV). This can be explained by several factors. First, HIV treatment programs (Ryan White Parts A and B) had a more sustained and consistent funding base, as well as a highly- developed performance management framework to support cross-organizational data and information sharing. The HIV treatment network had both formal and informal accountability mechanisms (see figure 11, Accountability Matrix) that required the exchange of data to verify compliance with program and contractual standards, and these were embedded within the EMA’s Ryan White comprehensive planning, priorities and allocations, and quality management processes.

The HIV prevention network was represented by organizations involved with CDC’s High Impact Prevention (HIP) program, which was coordinated by the Florida Department of Health in Broward County’s (BCHD) role as local lead agency. The local community planning process for the HIP program was a more recent development in the EMA, and prior prevention planning efforts had had more sporadic funding support from the Florida Department of Health. This discontinuity in support for local

prevention planning efforts resulted in a less cohesive network in its' current configuration. Responses to questions posed to key stakeholders also indicated a level of mistrust between organizational actors in the prevention network with the local lead agency. While not directly addressed in the SNA phase of this study, this qualitative insight helped explain the lower cohesiveness of the HIV prevention network. While the HIV treatment network's Information System practices were highly proscribed by federal program standards, the expansion of performance management measures implemented in the local quality management program indicated an association between highly cohesive networks with effective Information System practices.

Recommendations

- BCHD should work with BRHPC and other stakeholders to develop a transparent performance management system for HIV prevention programs. Data sharing agreements should be put in place to allow for the sharing of data between prevention and patient care programs (see above).

Research Question 2

What are the key environmental factors influencing change in public health network structure? What is the role of the local governmental public health agency within the network in adapting to change?

A) What are the key external forces driving change in the HIV/AIDS system of care?

A major external driver of change in Broward County involved the evolution of federal regulatory standards, which influenced the consolidation of services within the local service delivery network:

Predicting and adapting to change in the external environment is critical in organizational leadership. When working in interorganizational networks, prediction and adaptation to change requires a more collaborative leadership style. A major external driver of change in Broward County involved the evolution of federal regulatory standards, which influenced the consolidation of services within the local service delivery network. This occurred as funding restrictions increased and regulatory compliance grew more complex. One example of this consolidation involved the development of monitoring standards and other “conditions of award” that restricted local expenditures of Ryan White funds. During the 2006 reauthorization process, HRSA first required that at least 75% of Ryan White funds be spent on core medical services. Prior to this, AIDS service organizations (ASOs) built programs centered in large part on the provision of support services. After support service expenditures were limited to 25%, ASOs either began to provide core medical services, or closed or consolidated with other agencies. A second example, resulting from an audit by the HHS Office of the Inspector General on HRSA’s monitoring of grantees, was the implementation of the HRSA Monitoring Standards. These resulted in increasingly stringent program requirements, as well as more restrictive fiscal standards. For example, the 2012 HRSA standards removed the ability of local Ryan White provider agencies to charge rent as a program cost. Since agencies were limited to a 10% charge from their contracts for administrative costs (e.g. discretionary funds), this meant that agencies had to charge rent to their administrative budgets. Thus, agency budgets for operating costs were squeezed, resulting in consolidation or elimination of smaller ASOs. As ASOs reacted to administrative restrictions, diversification of funding sources became critical to survival. Agencies such as CARE Resources and Broward House became certified as Federally Qualified Community Health Centers (FQHC). Further funding diversification also occurred as these agencies sought certification as Patient Centered Medical Homes (PCMH). The general trend for ASOs has been for fiscal diversification, and introduction of clinical care into their service portfolio. In the process, ASOs evolved into diversified, community-based, clinical care organizations.

The passage of the Patient Protection and Affordable Care Act (ACA) contributed to consolidation in the local network: Another example of an external force that influenced the current configuration of the network (see Figure 4) was the passage of the Patient Protection and Affordable Care Act (ACA). The Ryan White program had a history of supporting the care of low income individuals by offering financial assistance with private health insurance premiums, copays and deductibles. In Florida, this occurred mainly in the Part B AIDS Insurance Continuation Program (AICP). The Broward EMA also funded a Health Insurance Continuation Program (HICP) with Part A funds. With the tax subsidies and premium support payments provided to low income individuals (those between 100 and 250% FPL), HRSA required that Ryan White programs “vigorously pursue” enrollment of Ryan White clients into ACA Marketplace Exchange plans. Between 2011 and the 2014 open enrollment period, the Broward EMA joined five other Part A jurisdictions and the State ADAP program in developing a coordinated system of enrollment and support of clients in the Marketplace Exchange.

The overall impact of ACA on the structure of local HIV/AIDS service delivery networks was an emerging phenomenon, but some identifiable effects can be described. First, as clients transitioned from Part A-funded providers to private insurance plans, clients were required to learn how to navigate different systems of care. As Ryan White-funded ASOs evolved into integrated primary care networks, clients grew to be accustomed to primary care providers that had specialized knowledge of the community and their clients. Learning how to interpret new insurance plans and provider networks represented a significant challenge for many Ryan White clients. There was also an impact on the ASOs themselves in terms of funding streams and client populations. As clients transitioned into new private insurance plans, ASOs needed to learn how to contract with insurance providers to maintain their current patient population. The ACA, combined with reductions in federal funding for safety net programs, forced ASOs to learn how to diversify their sources of funding. Many ASOs began to learn how to contract with insurance plans that were offered to Ryan White clients under the ACA. Those that

were successful continued to serve their client population, and diversified their funding base to remain sustainable.

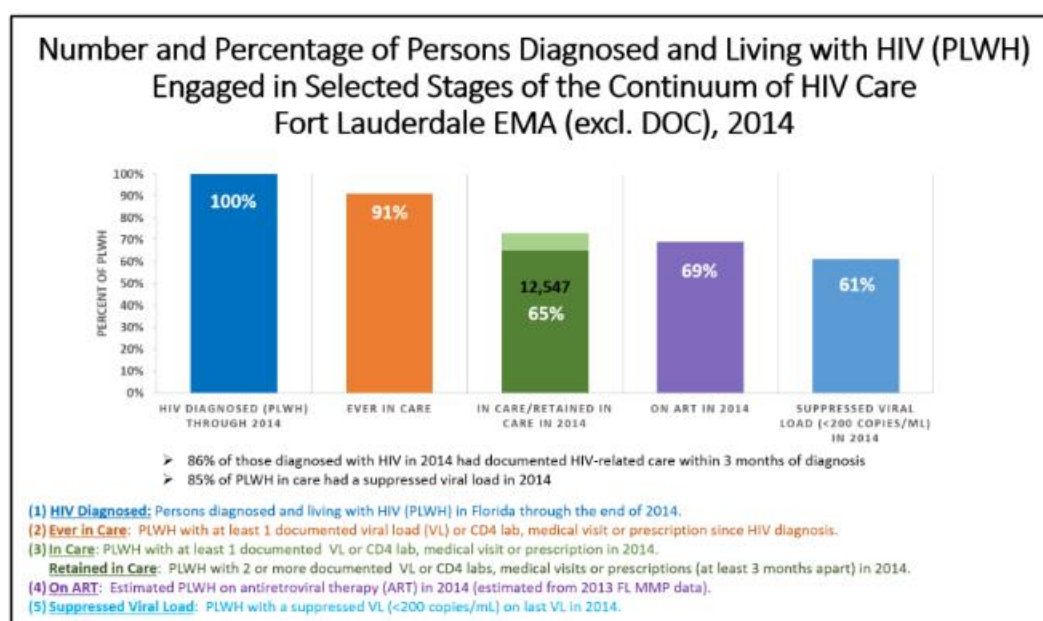
Factors in the Knowledge Management domain also influenced the integration of clinical care and prevention programs. On the patient care side, changes in programmatic requirements resulted in increased coordination in planning activities. For example, in 2011 HRSA required that EMAs submit plans for the Early Identification of Individuals with HIV/AIDS (EIIHA). These EIIHA plans involved the coordination of testing programs (considered prevention) with Early Intervention and Linkage Programs (considered patient care). EIIHA requirements resulted in greater coordination between prevention and patient care programs. Another requirement for EMAs was that they participate in Statewide Coordinated Statement of Needs (SCSN) plans. The SCSN planning efforts coordinated state Part B and Part A patient care program planning. Recently, CDC and HRSA released guidance on Integrated Planning, which brought together planning processes of CDC-funded prevention programs (such as High Impact Prevention) and Ryan White Part A comprehensive planning. The planning guidance required that jurisdictions submit plans that encompassed both prevention and patient care programs in the local jurisdiction.

B) How have these changes influenced cohesion of the network?

The adoption of the National HIV/AIDS Strategy, informed by “treatment as prevention” as an organizing paradigm, led to further integration of prevention and treatment programs: In the Knowledge Management domain, accountability of the local Part A program to federal planning guidelines was established in HRSA’s Part A Manual. The local planning requirements were tied directly to two recent federal initiatives: The National HIV/AIDS Strategy (NHAS), and the HIV Care Continuum Initiative (White House Office of National AIDS Policy). Local Ryan White planning councils were required to submit a Comprehensive Plan every three years. HRSA standards for these plans required planning councils to tie

local goals and strategies to each strategy contained in the NHAS. Planning Councils were also required to describe the epidemiology of the local epidemic, as well as the areas of unmet need in the local system of care. In the local statement of need, as well as in Grantee reporting to HRSA (annual Progress and Program Terms reports), planning councils and grantees used HIV Care Continuum statistics for planning and reporting purposes.

Figure 11. HIV Care Continuum, Broward County, Florida



This model quantified the composition of and outcomes for the local HIV-positive population. These measures included total population estimates for number of infected persons, numbers of persons identified as HIV-positive, number of persons linked to care, number of persons retained in

care, number of persons prescribed Highly Active Anti-Retroviral Therapy (HAART), and number of persons virally-suppressed. The model was based on the concept of “treatment as prevention,” which was a recent development related to the HPTN 052 study that showed that virally-suppressed patients reduced the risk of transmitting the virus to an uninfected partner by 96% (Cohen, et. al., 2012). The treatment-as-prevention framework stated that new HIV infections can be prevented if the population of persons living with HIV/AIDS (PLWHA) can achieve viral suppression. To achieve this outcome, PLWHA must be identified, linked to and retained in care, and be adherent to their plans of care to achieve viral suppression. In practical terms, this required a high level of coordination between agencies that focus on HIV outreach and testing (prevention) with those agencies that provide medical care (treatment). This recent emphasis of coordination across patient care and prevention programs, mirrored in integration between CDC and HRSA at the federal level, resulted in service integration at the local level.

The use of the HIV Care Continuum model in health planning was also tied to the structure and function of the local planning process. The Broward HIV Planning Council (HIVPC) led the collaborative process that created the comprehensive plan (with support staff in the BRHPC), and each HIVPC committee created an annual work plan that was tied to the local comprehensive plan. The local plan goals and strategies were directly tied to the goals of the NHAS. In this way, committee work plans were tied to NHAS goals through the comprehensive plan. The HIVPC Quality Management Committee also managed five Quality Improvement (QI) networks, which were based on funded service categories. In the QI networks, agency performance was evaluated based on HAB outcome measures and HIV Care Continuum statistics.

CDC community planning requirements under HIP influenced the process of local integration of patient care and prevention networks: Cohesion in the local network is best understood in terms of the integration between HIV treatment and HIV prevention programs. Changes in federal focus in HIV prevention programs occurred with the implementation of CDC’s High Impact Prevention (HIP) program.

The comprehensive community planning requirements under HIP influenced this process towards local integration. Prior to HIP, CDC had required comprehensive community planning for HIV prevention in 1993 for jurisdictions receiving federal prevention funds. The Florida Department of Health (FDOH) formed a joint patient care, prevention, and Hepatitis C planning body, and supported this with state funds for comprehensive community planning. In Broward County, the planning body received state funding until 2004. FDOH pulled funding support for prevention planning, but the local planning body continued to produce a final comprehensive prevention plan for 2005-2009. CDC also funded a REACH project (Racial and Ethnic Approaches to Community Health), which was coordinated by the Florida International University, Robert Stempel College of Public Health and Social Work. This prevention project adopted a community-oriented, behavioral intervention approach to prevention planning that sought to identify racial and cultural behaviors and barriers to care. This project ended in 2010, when CDC eliminated funding for HIV projects in REACH.

With the adoption of the National HIV/AIDS strategy (NHAS) by the Office of National AIDS Policy, and the concurrent adoption of HIP, integration between HIV prevention and treatment at the local level was accelerated. Broward County was one of two urban jurisdictions in Florida that were funded under HIP directly by CDC. The Broward HIV Prevention Planning Committee (BHPPC) was the local prevention planning body, which was appointed by FDOH. Ryan White HIV Planning Council (HIVPC) members expressed frustration at non-inclusion of HIV community advocates or treatment network representatives in the new planning body. There were, however, some early efforts at coordinated planning involving prevention and patient care entities. The “Broward Crosswalk” was a planning tool that integrated goals, strategies and activities across prevention and treatment programs. This model was tied to the NHAS goals and predated mandated Integrated Plan guidance that was later issued jointly by CDC and HRSA.

While factors in the Knowledge Management domain influenced cohesion of the local network,

Information System factors also influenced network cohesion. An important Information System factor driving integration between treatment and prevention was a study conducted by the HIV Prevention Trials Network (Cohen et. al., 2012) that showed a 93% reduction in HIV transmission in subjects who were virally suppressed. This study led to the concept of “treatment as prevention,” which meant that if a population achieved viral suppression (< 200 viral copies/mL), further transmission of the virus could be prevented. At the federal level, this resulted in initiatives such as the HIV Care Continuum initiative, in which jurisdictions and programs were evaluated based on the rate of viral suppression in the patient population. The key to improving viral suppression rates was to identify all positive persons, link and retain them in care, prescribe anti-retroactive therapy (HAART), and support other needs of clients (food, transportation, etc.) to increase the overall retention in care. For the EMA, the ability to evaluate outcomes based on the HIV Care Continuum was based on accessing the retention and viral load data for all clients. This indicated the critical need of having an adequate IT infrastructure to collect and manage clinical data across a provider network, appropriate policies in place to assure that client-level clinical data was provided, and processes to evaluate outcome data and to feedback analysis into a coordinated QM program.

C) How does the local health department influence integration of the HIV/AIDS system of care?

BCHD had a greater influence in the HIV prevention network than in the HIV treatment network:

The role of the local health department in the integration of patient care and prevention programs was considered due to the integral role that governmental public health plays in local public health systems in general. In Broward County, the Florida Department of Health in Broward County (BCHD) was a central actor in all networks considered in this study. Variation in organizational centrality (micro level) indicated that BCHD had a greater influence in the HIV prevention network than in the HIV treatment

network (see tables II and III). This pointed to a shifting role of the local health department in providing clinical services in the state of Florida. The local health department in Broward County provided the leadership in opening one of the first comprehensive care clinics for HIV/AIDS in Broward County in the mid-1980s. However, under the direction of the Governor, local health departments were “encouraged” to divest from providing clinical services in competition with private healthcare organizations. In Broward County, this resulted in an “abrupt disruption” of ambulatory care services for Part A clients in 2011. Thus, the Grantee was forced to move funding for ambulatory care services to other clinical providers in the local network. This illustrated how a shift in the political priorities at the state level influenced network structure at the local level. As the role of BCHD in the treatment network continues to evolve, consideration should be given to strategies to sustain and increase their influence in this network. One way this organization can increase its influence is to provide additional leadership at the local level to coordinate planning and service delivery across networks through “treatment as prevention” programs. Currently, the requirements of the Part A program to submit an annual Early Identification of Individuals Living with HIV/AIDS (EIIHA) plan requires that the Part A Grantee document to HRSA efforts in the EMA to improve outcomes of HIV testing (prevention) initiatives. Since Part A does not fund HIV testing programs, BCHD, as the lead for local prevention efforts, can take a leadership role in partnering with the Part A program in developing, implementing, and evaluating all testing initiatives under the EIIHA umbrella. This is one area where planning and service implementation overlaps across treatment and prevention programs. By taking a more formal leadership role in this effort, BCHD should be able to improve its influence (centrality) in the HIV treatment network.

Political priorities at the state level mediated the influence of BCHD in the local network. The ability of BCHD to exercise local strategic network leadership in the future will likely be influenced by the managerial control exercised by the central office of FDOH: One area where actions by governmental public health policies at the state level influenced local network cohesion involved implementation of

the ACA. While the local Part A and state AIDS Drug Assistance Program (ADAP, Part B) were eventually able to reach a level of coordination for supporting client enrollment in ACA insurance plans, there were significant barriers to taking action that were rooted in the differences between governmental affiliations of each program. The Part B program was administered through the Florida Department of Health (FDOH), HIV/AIDS Section and local health department offices who administered Part B services. Local health departments were staffed by FDOH employees, and were under administrative control of the central FDOH office in Tallahassee. Part A programs were awarded to the County Executive (Board of County Commissioners, BCC) in Eligible Metropolitan Areas. Local BCCs typically designated an agency of County government as the Grantee to administer the Part A program. In Broward County, this was the Broward County Department of Human Services (BCHS). Across Florida, local Part A jurisdictions were under the control of County agencies, while Part B programs were managed by FDOH-controlled local health department offices. During ACA implementation, Florida was one of 22 states that did not expand Medicaid, and a state in which the Governor actively opposed ACA implementation. In 2013-14, ACA Navigators were prohibited from local health department offices. Local health department staff were prohibited from using the phrases “Medicaid Expansion” and “Affordable Care Act” in written or public communications. This posed a serious constraint for the state ADAP, which was required by HRSA to “vigorously pursue” enrollment of clients into ACA plans. That any level of coordination was attained was significant given the constraints placed on the agency with the main role in coordinating a statewide effort.

When evaluating the role of the local health department in the local HIV/AIDS system of care in Broward County, consideration should be given to the legal structure of governmental public health in Florida. In addition, within the Ryan White program, county governmental agencies (Broward County Human Services Department, BCHS) had considerable influence within the HIV patient care network, given its role as the Grantee. Collaborative action in the local network at times was constrained by the

control the central health department office in Tallahassee (FDOH) had over the local health department office (BCHD). The influence of the local governmental public health agency on local network cohesion was therefore a function of its relationship within the state intergovernmental structure of the governmental public health system.

The brokerage role of central organizations was important when considering how information and resources flowed through the network. As federal policy facilitated consolidation in an increasingly integrated network, organizations that had not previously coordinated services or exchanged data/information found themselves participating in an integrated network that required new forms of coordination and service integration. That BCHD had the highest centrality scores in the Integrated HIV Treatment/Prevention network was an indication of the critical role that organization can play in future interorganizational work. The ability of BCHD to exercise strategic network leadership at the local level will likely be mediated by the managerial control exercised by the central office of FDOH. As the lead agency for the Part B program (ADAP and Part B Services), the central office of FDOH exercises administrative control of local Part B programs through mechanisms rooted in the constitutional structure of state government in Florida. These mechanisms include fiscal and administrative oversight of the Part B program, convener of statewide planning processes such as the Statewide Coordinated Statement of Need, and as quality management and contract monitoring of local Part B consortiums, among others. More tacit forms of control identified in this study include the political control of speech, divestiture of clinical services by public entities, and a funding divestment within the Florida Department of Health. It is these tacit measures that makes a future leadership role of BCHD in an integrated, interorganizational network problematic.

A second contextual factor in understanding the variation of centrality scores across relationship types was the overall accountability framework within the local networks, and between the local networks and federal/state authorizing entities/funders. The local HIV/AIDS public health system

reported to at least three federal stakeholders: The Part A program reported to HRSA's Bureau of Metropolitan HIV/AIDS Programs; the Part B program (under the Florida Department of Health), reported to HRSA's State Division of HIV/AIDS programs. The important distinction here was that, on the local level, each Ryan White program (Part A and Part B) reported to different divisions within HRSA, and had different Project Officers. In terms of reporting between local programs and the federal government, there were different reporting requirements, reporting timelines, and reporting recipients. While one might assume that there was some level of coordination within HRSA for Ryan White programs, at the local level this illustrated where Part A and Part B had competing priorities within the accountability framework established within the Ryan White program. A third local-to-federal reporting relationship relevant for this discussion was that between HIV prevention programs and the CDC. In Broward County, CDC prevention funds (High Impact Prevention) were awarded directly to the local health department office. In most other jurisdictions, federal prevention dollars were passed through the FDOH central office in Tallahassee. In Broward County, the local health department unit was more directly connected in the reporting relationship with CDC. These local-to-federal reporting relationships influenced the way the local system of care coordinated services, as well as the overall network structure.

Recommendations

- The HIVPC should provide ongoing education to Ryan White agencies to assure that all stakeholders are fully aware of emerging federal requirements.
- Enrollment patterns of clients in ACA plans should be closely monitored to prevent disruption in medical services.
- BCHD, NRHPC, and BCHS should maintain an integrated planning process that links HIV patient care and prevention programs.
- BCHD, NRHPC, and BCHS should maintain an integrated planning process that links HIV patient care and prevention programs.
- BCHD should work with BRHPC and other stakeholders to develop a transparent performance management system for HIV prevention programs. BCHD leadership should determine appropriate strategy to facilitate the local office's ability to provide local leadership to support accountability and transparency in local prevention programs

Research Question 3

How do central actors influence practices and patterns of information exchange in public health networks?

- A) Which organizational relationships are most important in facilitating the application of information and knowledge to system improvements?

Hanneman and Riddle (2005) discussed social network analysis at both the micro and macro levels. At the micro level, the focus is on the relational position of actors within a network. The macro level considers the entire network. In their discussion of power in social networks, Hanneman and Riddle

discussed the importance of actor centrality at the micro level, as well as the context of that power within the overall network. Therefore, the macro level describes the overall power of the network, and the micro level describes the distribution of power within the network. In this study, cohesion provided several measures at the macro level, and centrality informed conclusions drawn about individual actors at the micro level.

The relationships between BRHPC, BCHS and BCHD were the most important in facilitating the integration of services between patient care and prevention, and between the Part A and Part B programs: At the micro level, three organizations played central roles in both the patient care and prevention planning networks. These were the Broward County Department of Human Services (BCHS) the Broward Regional Health Planning Council (BRHPC) and the Florida Department of Health in Broward County (BCHD). BCHS was the Ryan White Part A Grantee, and provided funding for core medical and support services to the Part A Eligible Metropolitan Area (EMA). BRHPC was funded under Part A to provide Centralized Intake and Eligibility Determination (CIED, client intake), Clinical Quality Management (CQM) for the EMA, and HIV Planning Council (HIVPC) support. A third organization, Florida Department of Health in Broward County (BCHD) exhibited high centrality scores in the HIV Prevention Network, but less of a central role in the HIV Treatment Network. Qualitative data indicated that BCHD's elimination of outpatient ambulatory care under the Part A program resulted in a less central role in the patient care network. BCHD, as an entity of the state Health Department (FDOH), had a very central role in the Part B program (this included local Part B services and the AIDS Drug Assistance Program, ADAP), but the discontinuation of Part A services impacted its central role in the local Part A HIV Treatment Network.

BCHD served as a critical linking organization between the HIV patient care and HIV prevention networks: Since BCHD had the most central role (and highest centrality score) in the HIV Prevention Network, it served as a critical linking organization between organizations that were primarily affiliated

with the HIV Treatment Network and those focused mainly in the HIV Prevention Network. This was evident when comparing Centrality scores for organizations across these two networks (Table II). In the HIV Treatment Network, BCHD had the fourth highest betweenness centrality score, and it had the highest score in the Combined Treatment/Prevention Network. This illustrated how an organization's influence can change depending on the relational context under consideration. Since the HIV Prevention Network was relatively new, its individual members were less connected to the HIV Treatment Network, and BCHD was an organization that connected the two networks, therefore having a higher betweenness centrality score. Comparison of centrality scores for key organizations indicated varying levels of influence across network types. When comparing the HIV Treatment network with the Integrated HIV Treatment/Prevention network, BCHD varied considerably. Table II indicated that BCHD ranked fourth in betweenness centrality and third in brokerage centrality. BCHD ranked highest for these centrality scores in the Integrated HIV Treatment/Prevention network.

Table III compared centrality scores for individual actors across the HIV Treatment network, the HIV Prevention network, and the Data Exchange network. BCHD's degree and betweenness centrality varied across these networks as well. The high score in the HIV Prevention Network was reflective of the role the agency played as a local lead agency for the CDC High Impact Prevention (HIP) grant. Broward and Miami-Dade counties were the only local jurisdictions in Florida that received funding directly from CDC. Other jurisdictions in the state received HIP funds as a pass-through from the State health department. BCHD's low centrality score for the Data Exchange Network reflected their limited role in providing clinical services for the Part A program. The local health department was involved in data exchange relationships in Part B local services and the AIDS Drug Assistance Program (ADAP), but this data exchange is more likely to occur through the state CAREWare system than the local Provide Enterprise (PE) system that the Part A program utilized.

Network measures in this study focused both on the roles and relationships of individual

organizations within specific network contexts (micro measures), as well as comparative measures across different network types (macro measures). One issue that warrants further consideration is the relationship between micro and macro measures within networks, as well as differences in micro measures (centrality) for the same organizations across network types. While qualitative data provided some insights into the leadership challenges faced by the BCHD in the treatment and prevention networks, understanding the implications in differences in centrality across networks could not be statistically evaluated. Future research should focus on how organizational centrality changes across network typologies, and for organizations in HIV/AIDS service delivery networks, identify strategies to maximize organizational influence while improving network-level outcomes.

The administrative management of client-level viral load data by both BRHPC and BCHS facilitated network-level knowledge management practices: Another important relationship dynamic that was considered was that between BRHPC and BCHS (the Grantee). As a local health planning council, BRHPC was a quasi-governmental, nonprofit organization with significant organizational capacity and public health expertise. BRHPC filled three very important roles in the EMA: (1) coordinator of the Centralized Intake and Eligibility Determination (CIED) system; (2) contracted Clinical Quality Management (CQM) vendor for the Grantee; and (3) planning council support. As coordinator of the CIED system, BRHPC eligibility staff served as a neutral entity to verify client eligibility and referral source for Ryan White services. The CIED program assured that Ryan White was the payer of last resort (a key accountability mechanism), and that clients were given unbiased information for service referrals. In addition, the CIED process was one location where viral load data was verified and collected for each client. The collection of viral load data was critical in maintaining and measuring client-level and system-level health outcomes, and for driving the QM process. As discussed below, client-level viral load data

was one key component of the network's information system, and data use practices with viral load results facilitated network-level knowledge management practices.

As the entity contracted by the Grantee for CQM, BRHPC provided the expertise and capacity to support a robust CQM program. While BCHS shared responsibility in administering the QM program, BRHPC extended the capacity of the network to build an innovative and successful program. One consideration identified in the qualitative data related to the relative roles and responsibilities of these organizations for CQM within the system of care. One interview subject made the observation that the BCHS was associated with "compliance," and that to have a CQM program where information and learning are truly shared, the CQM role should not be equated with contract compliance. Rather, contracted agencies (BRHPC) should conduct CQM initiatives in a less compliance-oriented learning environment. In other EMAs (author observation), QM programs were administered by the Grantee's office as part of HRSA's mandate for a QM plan. Grantee offices were permitted 5% of the total grant award for QM activities, and in some cases these were administered solely from the Grantee office. While this research did not study this question, an examination of difference between CQM models may be an area deserving further inquiry.

B) How do information system practices enhance network level knowledge management?

The EMA combined financial, utilization, quality and health outcomes data to drive accountability and quality improvement processes: The third research question addressed how public health information systems supported knowledge management across organizational boundaries in the local public health system. In the Accountability domain, the most important factor was that as a network, the Part A program required access to client-level clinical data (viral load test results) for more than 7000 clients. While not all Part A clients received primary care from a Part A-funded provider, to be

eligible, clients were required to submit viral load test results every six months to maintain eligibility for Part A services. This allowed the EMA to use clinical data to drive the QM process, and to measure outcomes in terms of retention in care rates and community viral load. Based on this requirement, the EMA utilized clinical data to drive accountability and quality improvement processes. A second element to the EMA's QM platform involved the integration of expenditure and service utilization data with clinical outcomes data. As described previously, the PE system was used for agency billing and reimbursement. As agencies submitted reimbursement requests through PE, the system only allowed eligible services to be posted. As services were documented and reimbursements processed, the resulting fiscal and utilization data was matched to clinical outcome data (retention in care and viral loads). These data were communicated across the network by data use practices that supported interorganizational accountability. These included:

- (1) Preparation of combined data using a variety of visualization presentation models for the Priorities and Allocations (P&A) process. This process governed allocations and contracting;
- (2) Review of clinical outcome data within QI networks. The QI networks were service-category specific, and analysis of outcomes and evaluation of Service Delivery Models (SDM);
- (3) Review of SDMs, Standards of Care, and target outcome measures in the Quality Management Committee (QMC) of the HIVPC. The QMC served as the bridge between the QI committees and the full HIVPC. The QMC was the forum in which Grantee staff, contracted QM support, and funded agencies shared best practices and developed improvements to the system of care.
- (4) The HIVPC facilitated program evaluation based on NHAS and Care Continuum goals. While the Broward EMA integrated HAB outcome measures in its operational processes, an expanded menu of outcome measures was utilized across the Part A program. These included NQC In+Care campaign measures and local outcome measures. The full menu of outcome measures, cross-referenced by agency expenditure and client utilization analysis, supported network-level

knowledge management and sharing of best practices across the system of care (see Appendix C).

Data sharing and service integration across CDC and HRSA programs at the local level was supported by a committee structure in the HIV Planning Council that resulted in effective knowledge management across the network: The EMA supported efforts at multiple levels that facilitated a comprehensive performance management system that incorporated patient care and prevention programs. This included the National Quality Center's (NQC) In+Care campaign, a capacity building QM program. Under this program, the EMA worked with the NQC to evaluate the QM program, develop process improvements, and report changes in key indicators to NQC. The EMA was awarded the National Quality Award in 2012. The key relationship supporting these efforts was that between the Grantee (BCHS) and the BRHPC. The expertise of the BRHPC staff extended the capacity of the EMA to conduct in-depth analysis of the combined fiscal/utilization/outcome data, and provided a neutral forum for agencies to discuss issues related to the quality and efficiency of services.

Another role of the BRHPC related to the Information System domain was their role in clinical quality management (CQM), combined with their role as planning council (HIVPC) support. Staff assistance in supporting the QI networks, and the QM committee, were instrumental in communicating critical information to both consumers and organizational stakeholder in the system of care. The support for the information exchange processes that formed the bedrock of planning council decision-making was critical for knowledge management in the interorganizational context. The partnership between BCHS and BRHPC in Broward County supported the information system infrastructure, and the related supportive practices of information exchange, that facilitated network level knowledge management for the local system of care.

Recommendations

- BCHD should provide local leadership to support greater transparency in data sharing between prevention and patient care programs. BCHD should consider using the HIVPC committee structure to develop a performance management system for prevention programs.
- BRHPC, BCHS and the HIVPC should develop a knowledge repository that is accessible to Ryan White clients. Clients should be offered training and support to become active users of data in decision making.

Leadership Implications

The Institute of Medicine (2011) called for a transformation of public health and medical care into an integrated health system that would be held mutually accountable for the health outcomes of the local community. This case demonstrated that accountability can be both formal and informal. The information system represented a shared set of performance management practices distributed across multiple organizations, codified rules of data exchange enforced by contracts and data sharing agreements, and system-wide outcome evaluation supported by a robust IT infrastructure. Mutual accountability for the health outcomes of the network was established by formal mechanisms, such as contracts between agencies or federal requirements tied to conditions of grant award. But accountability also occurred through informal means. In the case of HIV/AIDS, participation by the affected community assured accountability of the institutional public health system to the community. The model of patient involvement in key decision-making processes was won through the work of gay activists through years of struggle. The case of the Broward HIV/AIDS system of care illustrated how mutual accountability for health outcomes is both formally established through program standards and contractual obligations, but is also a function of informal processes that shape relational patterns in the local system of care.

Public health networks are social structures that manage the delivery of essential public health services in a community. Leadership within such networks is practiced at multiple levels: the organization, organizational cliques, and the whole network. Leadership is also practiced across a continuum of formal and informal strategies. Formal leadership is represented by command and control strategies common within single organizations, while leadership involving multiple organizations across a network requires informal strategies of persuasion and dialogue. Strategic network management refers to the mindset and strategies employed by an individual leader to influence the behavior of organizations across a service delivery network across these different contexts. Tools such as SNA offer leaders the ability to visualize complex interorganizational networks across multiple relationships. An understanding of basic network concepts can assist today's public health leader in advocating for strategies that have impact outside of their individual organization.

Public health leadership is also context-dependent. The options for public health leaders to act to address a health problem are dependent on their structural position within the organization, and the organization's position within the network. Mutual accountability for health outcomes occurs within a political context that constrains options for the purposive action of the network. Where multiple accountability mechanisms and processes were evident in Broward County EMA, the Part A Grantee and governmental public health actors played complementary leadership roles depending on the issue and the window of opportunity for acting. The example of ACA implementation illustrated the differences in the options available to public health leaders in the state health department system versus the local county government system. This example demonstrated how public health leaders acted in addressing common goals, with each actor taking differing strategies based on their position in the network. Organizations behave differently and are responsive to different stakeholders. Network integration is possible when local organizations are mutually accountable to each other. When local lead agencies are responsive to different federal funders, the strategic network leader must translate the imperatives of

federal stakeholders into local action across the public health network. This requires an ability to understand and be responsive to the constraints of other actors, and to find areas of agreement and mutual benefit. These differing stakeholder relationships shape options for purposive action.

The Broward EMA provided an example of Checkland's Information System: a mature information system, supported by an information technology (IT) platform with management and communication practices to improve system performance and distribute knowledge across an inter-organizational network. The information system was comprised of three related components: IT infrastructure, Community planning/QM practices, and feedback processes. The IT infrastructure provided the means to combine clinical, expenditure and health outcome data. Reliable access to these three data points at the network level facilitated QM processes. The case provided a clear example of how public health systems can organize data within the context of an information system to establish accountability for health outcomes on behalf of the network. For leaders working across organizational boundaries, an expanded set of leadership approaches is required.

Ryan White Part A programs in other jurisdictions can similarly employ strategies that improve health outcomes by effective management of service delivery networks. The case presented in this study demonstrated how integration of service delivery systems are tied to integration of data systems. As patient care and prevention programs achieve greater levels of integration, consideration needs to be given to the information systems supporting interorganizational work. In addition to the physical assets of data management systems, robust information systems require effective performance management systems to assure that information is fed back into the service delivery system to improve the quality and efficiency of services. In this case, the HIV planning council was supported by a committee structure and external consulting support that drove the performance management system. A critical component in Ryan White programs is the active involvement of persons living with HIV/AIDS as members of local planning councils. These non-aligned members often have varying levels of experience working with

clinical data, so a robust system of education and support for these members is important. With these components in place, EMAs would have the necessary tools to develop data portfolios that include fiscal, utilization, quality, and health outcome data. Combining data in this manner opens up possibilities to tie health outcomes to specific investments in public health services.

The HIV/AIDS network in Broward County was part of a larger story of the activism and leadership of the gay community in the late 1980s and early 1990s that led to an urgency in building systems of care for persons who were marginalized and stigmatized by the political establishment. The Ryan White program was named after a teenager who became HIV-positive through a blood transfusion, and experienced the stigma that was commonly directed towards the gay community. The grassroots leadership practiced by the early AIDS activists demonstrated how community organizing and direct action can transform the public health system. This “bottom up” approach transformed public health practice in significant ways, but as the system matured, new challenges emerged that required that leadership be applied across interorganizational networks. The evolution of the HIV/AIDS health system has been impacted by advances in treatment, changes in health policy, and the adoption of Treatment as Prevention as a core organizing paradigm. As this system has evolved, more sophisticated performance management and accountability processes have become established. The information system that supports the HIV/AIDS system of care represents the merging of health technology, a health services planning process, and mechanisms of accountability that provides the means to demonstrate that the health outcomes of the Broward EMA are realized with the support of an interorganizational system of knowledge management.

Appendices

Appendix A, Qualitative Code Set

<i>Code Class</i>	<i>Code</i>	<i>Research Question</i>
Acts		
Adjustment to Program Design	AT-PD	1.2
Adjustment to Program Implementation	AT-PI	1.2
Sharing Best Practices	AT-BP	1.2
Negotiating Contract Requirements	AT-CN	1.1
Negotiating Administrative Requirements	AT-AR	1.1
Activities		
Policy Advocacy	AS-PA	1.2
Prevention Services Provided	AS-PS	2.1, 3.1
Clinical Services Provided	AS-CS	2.1, 3.1
Community Health Planning	AS-CP	2.1, 3.1
Community Health Surveillance	AS-HS	2.1, 3.1
Meanings		
Leadership	M-L	1.1, 1.2, 2.1
Political Management	M-PM	1.1, 1.2, 2.1
Best Practices	M-BP	1.2, 2.1, 3.1
Public Health System	M-PHS	1.1, 2.2
Attributes		
Organization Type		
Government	AO-G	2.2
Community Nonprofit	AO-N	2.1
Academic	AO-A	2.1
Consultant	AO-C	2.1
Healthcare-hospital	AO-HH	2.1
Healthcare-ambulatory	AO-HA	2.1
Healthcare-pharmacy	AO-HP	2.1
Healthcare-primary care	AO-HPC	2.1
Service Type		
Clinical Preventative	AS-C	2.1, 3.1
Community Preventative	AS-P	2.1, 3.1
Pharmacy	AS-Ph	2.1, 3.1
Oral Health	AS-O	2.1, 3.1
Mental Health	AS-M	2.1, 3.1
Case Management	AS-CM	2.1, 3.1

Code Class	Code	Research Question
<i>Relationships</i>		
Statutory	R-S	1.1
Program Outcome Reporting	R-OR	1.1
Fiscal Reporting	R-FR	1.1
Informal leader to leader	R-LL	1.1, 1.2
Contractual	R-C	1.1
Data Exchange-Direct		
Clinical	RD-C	3.1
Program	RD-P	3.1
Admin	RD-I	3.1
Data Exchange-Indirect		
Clinical	RD-c	3.1
Program	RD-p	3.1
Admin	RD-a	3.1
Service Coordination	R-SC	1.2, 2.1, 3.1
Best Practice Dissemination	R-BPD	1.2, 3.1
Resource Exchange (other)	R-RE	1.1

Interview Guide

The purpose of this interview is to ask about your experiences working in HIV/AIDS prevention and treatment in Broward County. What I am interested in learning about is how local organizations relate to each other, as well as how they individually and collectively negotiate in the political environment. My questions will cover three themes: (1) practices related to information sharing and data exchange at the local level; (2) leadership and strategy within the HIV/AIDS prevention/treatment system in Broward County; and (3) engagement with external partners and/or state and federal agencies.

Information Sharing and Data Exchange

To begin, I am interested in looking at how information and data are used and shared in the HIV/AIDS prevention/treatment system as it relates to program planning, quality improvement and coordination of activities across organizations.

- (1) In your experience, what types of data have been most useful in supporting the development of the Broward County HIV/AIDS comprehensive plan? The quality improvement process?
- (2) How does data generated from your organization/program get used in the planning process? The quality improvement process?
- (3) In your experience, how has the quality improvement process provided information to improve the coordination of HIV/AIDS services in Broward County?
- (4) Please describe any direct exchange of data between your organization and another member of the HIVPC? Other HIV/AIDS prevention or treatment programs?
- (5) What are some barriers to effective communication across the HIV Planning Council (HIVPC) network? Where does communication work well?
- (6) How would you describe the current practice of information sharing within the HIVPC network? What about informal sharing?

I would like to ask some questions about coordination of service delivery and the quality improvement processes the HIVPC network uses to evaluate and improve services in Broward County:

- (7) How would you describe the level of coordination between programs and providers in the HIVPC network?
- (8) In what ways has your organization adjusted a program or service delivery in response to a quality improvement finding?
- (9) Overall, how has the performance monitoring process influenced how your organization delivers services?
- (10) Please describe any experience you have had in which a promising practice you shared in a network meeting was picked up and adopted by another organization in the network. Has your organization adjusted a practice based on information shared by others in the network?

Leadership and Strategy

I would like to ask a few questions about how the HIVPC network develops and implements strategy, and the leadership practices that support strategic thinking and action.

- (11) Please describe your role in the development of the Broward County HIV Comprehensive Plan
- (12) Can you describe any important changes or new strategies for addressing the HIV/AIDS problem?
- (13) How did the planning process prioritize strategies regarding HIV treatment? Were these proscribed by the funder? Which ones were developed locally?
- (14) How did the planning process incorporate strategies around engaging the broader system (e.g. HIV prevention)? In what other settings have you observed this being discussed?
- (15) Were there opportunities in the planning process to discuss the relationship between the HIVPC and outside agencies that influence, but are not directly involved in, HIV treatment services (e.g. County Commissioners, other elected officials)? Are there other forums where strategies to engage the local political system can be safely discussed? How are these strategies fed back into the HIVPC planning process?
- (16) *(picking one example selected from questions 12-15)* Describe the leadership that was required to make the process successful.
- (17) What was the role of your organization in this process?

Outside Engagement

In this last set of questions, I would like to discuss ways in which the HIVPC connects with other networks and stakeholders in the public health system:

- (18) Can you talk about the relationship between HIVPC network as a whole and federal funders/project officers? How does the state health department influence this relationship (either positively or negatively)?
- (19) Can you describe an instance where an HIVPC member (or the network as a whole) was effective in modifying a program mandate of a state or federal funding authority?
- (20) Can you describe an instance where an HIVPC member (or the network as a whole) advocated for a change in state or federal policy related to HIV/AIDS?
- (21) What can you tell me generally about the relationship between the HIVPC network and the state health department? HRSA? CDC?
- (22) What other HIV-related prevention or treatment initiatives in Broward County or south Florida are connected to HIVPC? What is the nature of that relationship?
- (23) Are there similar initiatives that are not connected? How can this be improved?
- (24) In what ways do you share the results of your work (e.g. health outcomes, other successes) with stakeholders outside of the HIVPC network (example: local political leadership, influential community organizations, etc.)

Appendix C, Broward Scorecard

FY 2012/13 Scorecard: Part A & MAI Outpatient/Ambulatory Health ELIGIBILITY: HIV+, Broward Resident, </=400% FPL										
Fiscal Year	Part A & MAI Service Allocations			Final Part A & MAI Expenditures				EMA Award		Priority
FY	Part A	MAI	Total	Part A	MAI	Total	% change	Total Part A/MAI	% of Total	Rank
2012	\$6,504,282	\$100,000	\$6,604,282	\$5,743,196	\$99,936	\$5,843,132	5%	\$15,390,658	38%	1
2011	\$5,920,360	\$234,473	\$6,154,833	\$5,482,813	\$99,993	\$5,580,806	-9%	\$15,006,261	37%	1
2010	\$5,944,675	\$120,035	\$6,064,710	\$5,876,974	\$263,344	\$6,140,318	-1%	\$15,395,252	40%	1
2009	\$4,534,544	\$176,185	\$4,710,729	\$5,833,076	\$344,635	\$6,177,711	24%	\$15,188,452	41%	1
2008	\$4,271,208	\$120,079	\$4,391,287	\$4,639,829	\$331,075	\$4,970,904		\$15,171,291	33%	2
Health Insurance Exchange Cost Estimate-Silver Plan (does not include smoking surcharge </=50% premium full cost)										
Federal Poverty Level (FPL)	PART A/MAI Medical Clients by FPL Range		Annual Premium w/ Subsidy Applied		Out-of-Pocket Cost w/ Subsidy	Total Annual Cost (Premium & Out of Pocket)		Medicaid Expansion		
			Cost as % of Income	FPL Range		Min	Max			
	#	%	Min	Max	Min	Max				
0%-99%	2,258	58%	Not Eligible for Premium Subsidy or Out-of-Pocket Subsidy							Eligible
100%-138%	728	19%	2%	\$230	\$317	\$1,964	\$2,194	\$2,281		
139%-150%	119	3%	3%-4%	\$479	\$689	\$1,964	\$2,443	\$2,653		Not Eligible
151%-200%	379	10%	4%-6.3%	\$694	\$1,448	\$1,964	\$2,658	\$3,412		
201%-250%	246	6%	4%-6.3%	\$1,455	\$2,298	\$2,975	\$4,430	\$5,273		
251%-285%	117	3%	6.3%-8%	\$2,307	\$2,620	\$2,975	\$5,282	\$5,595		
286%-299%	21	1%	9%	\$2,958	\$3,092	\$2,975	\$5,933	\$6,067		
300%-349%	23	1%	9.5%	\$3,275	\$3,810	\$3,987	\$7,262	\$7,797		
350%-400%	15	0.4%	9.5%	\$3,820	\$4,366	\$3,987	\$7,807	\$8,353		
401% & over	4	0.1%	NOT Eligible for Health Exchange Premium Subsidy, Out-of-Pocket Subsidy or Medicaid							
Part A/MAI Medical Cost Ranges			ACA Impact on Ryan White Part A Medical Services							
Cost Range	Avg Cost	Clients	* Exchange: 100-400% FPL*, ineligible for Medicaid & employer insurance can receive assistance							
\$0-\$1,000	\$597	1,380	* Premium subsidy reduces premium cost based on % of income (100% FPL=2% of income)							
\$1,001-\$2,000	\$1,428	1,715	* Long transition period may require Part A medical to be fully funded, at least initially, in FY 14							
\$2,001-\$3,500	\$2,507	550	* ADAP medical deductible, copay and premium assistance funding will likely be greatly expanded							
\$3,501-\$5,500	\$4,226	123	* Potential need for Part A emergency deductible, copay and premium assistance							
\$5,501-\$9,326	\$6,654	22	* Undocumented & lawfully present immigrant w/in 5 years of residency barred from federal benefits							
\$0-\$9,326	\$1,403	3,790	* PLWHA out of/or never in care may need assistance while being reconnected or connected							
FY 2012/13 Part A/MAI Demographics						FY 2012/2013 Other Medical Funding				
Total Clients	# New	% New		Male	Female	Transgende	Source	Clients	Amount	
3,790	997	26%	Gender	72%	28%	1%	Ryan White Part C	182	\$143,437	
				Black	White	Other	Ryan White Part D	1,329	\$369,969	
Ryan White Part A & MAI Providers			Race	53%	46%	1%	RW Part B AICP	712	\$3,782,640	
Type	Part A	MAI		Hispanic	non-Hispanic	Haitian	Veterans (VA)	377	\$660,609	
Number	5	1	Ethnicity	19%	81%	14%		2,600	\$4,956,655	

FY 2012/13 Scorecard: Part A & MAI Outpatient/Ambulatory Health				ELIGIBILITY: HIV+, Broward Resident, <=400% FPL			
HAB HRSA HIV Performance Measures							
HAB Performance Measure	Numerator	Denominator	Achieved	HAB Performance Measure	Numerator	Denominator	Achieved
CD4 T-Cell Count	2,559	3,291	78%	Chlamydia Screening	549	808	68%
HAART	316	329	96%	Gonorrhea Screening	547	808	68%
Medical Visits	2,765	3,291	84%	Syphilis Screening	3,018	3,922	77%
Oral Exam	1,647	3,922	42%	Cervical Cancer Screening	404	1,083	37%
Lipid Screening	2605	3,310	79%	Hepatitis B Screening	3,281	3,922	84%
TB Screening	2,545	3,915	65%	Hepatitis C Screening	2,985	3,922	76%
Fort Lauderdale/Broward EMA Medical Outcome							
Outcome	Slow/prevent clients HIV disease progression				Numerator	Denominator	Percent
Indicator 1:	80% of clients with a CD4 <500 are on HAART				1,660	1,938	86%
Indicator 2:	70% of clients on HAART over 6 months will have a VL <400				2,748	3,264	84%
National Quality Center (NQC) inCARE Retention Measures for Part A/MAI Medical Patients							
NQC Retention Measure #1: Gap Measure					Numerator	Denominator	Percent
Numerator:	Patients with no medical visits in the last 180 days of the measurement year				23	1,572	1%
Denominator:	Patients with one or more medical visits in the first six months of the measurement year						
NQC Retention Measure #2: Medical Visit Frequency					Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in EACH 6 month period of the 24-mos period				1,070	1,134	94%
Denominator:	Patients with one or more medical visits in FIRST 6 month period of the 24-mos period						
NQC Retention Measure #3: Patients Newly Enrolled in Medical Care					Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in each 4-month period in the measurement year				97	128	76%
Denominator:	Patients newly enrolled w/ medical provider & >=1 visit in 1st 4 mos. of measurement year						
NQC Retention Measure #4: Viral Load Suppression					Numerator	Denominator	Percent
Numerator:	Patients with a viral load <200 at last Viral Load test in the measurement year				1,386	1,803	77%
Denominator:	Patients with at least one medical visit in the measurement year						
Grantee Comments							
1. Enhance the emphasis on adherence and retention in medical care with a focus on those sub-populations that are not achieving virologic suc							
2. Review ability to establish and integrate a patient centered medical home model of care for all core medical services.							

FY 2012/13 Scorecard: Part A & MAI Medical Case Management							ELIGIBILITY: HIV+, Broward Resident, <= 300% FPL			
Fiscal Year Part A & MAI Service Allocations				Final Part A & MAI Expenditures				EMA Award		Priority Rank
FY	Part A	MAI	Total	Part A	MAI	Total	% change	Total Part A/MAI	% of Total	
2012	\$1,134,105	\$176,644	\$1,310,749	\$1,097,100	\$23,544	\$1,120,644	0.2%	\$15,390,658	7.3%	5
2011	\$1,090,105	\$29,953	\$1,120,058	\$1,088,560	\$29,943	\$1,118,503	-9%	\$15,006,261	7.5%	3
2010	\$1,282,612	\$29,953	\$1,312,565	\$1,174,211	\$58,835	\$1,233,046	-3%	\$15,395,252	8.0%	4
2009	\$1,400,201	\$29,953	\$1,430,154	\$1,243,500	\$29,761	\$1,273,261	5%	\$15,188,452	8.4%	3
2008	\$1,154,840	\$29,953	\$1,184,793	\$1,184,341	\$29,924	\$1,214,265		\$15,171,291	8.0%	4
Part A/MAI Utilization & Demographics							Funded Providers		FY 2012 -13 Other Funding	
Total Clients	# New	% New	Male	Female	Trans.	RW Providers		Source	Funding	Clients
3,509	951	27%	74%	26%	1.0%	Part A	MAI	Part C	\$173,099	1,072
Black	White	Other	Hispanic	non-Hispanic	Haitian	7	2	Part D	\$365,805	1,114
55%	44%	1%	17%	83%	11%			PAC Waiver	\$606,200	659
Health Insurance Exchange Cost Estimate-Silver Plan (does not include smoking surcharge <=50% premium full cost)										
Federal Poverty Level (FPL)	RW PART A and MAI		Annual Premium w/ Subsidy Applied			Out-of-Pocket Cost w/ Subsidy	Total Annual Cost (Premium & Out of Pocket)		Medicaid Expansion	Not Eligible
	# of MCM Clients	% of MCM Clients	Cost as % of Income	FPL Range			Min	Max		
0%-99%	2,188	62%	Not Eligible for Premium Subsidy or Out-of-Pocket Subsidy						Eligible	
100%-138%	608	17%	2%	\$230	\$317	\$1,964	\$2,194	\$2,281		
139%-150%	100	3%	3%-4%	\$479	\$689	\$1,964	\$2,443	\$2,653		
151%-200%	313	9%	4%-6.3%	\$694	\$1,448	\$1,964	\$2,658	\$3,412		
201%-250%	175	5%	4%-6.3%	\$1,455	\$2,298	\$2,975	\$4,430	\$5,273		
251%-285%	89	3%	6.3%-8%	\$2,307	\$2,620	\$2,975	\$5,282	\$5,595		
286%-299%	18	1%	9%	\$2,958	\$3,092	\$2,975	\$5,933	\$6,067		
300%-349%	10	0%	9.5%	\$3,275	\$3,810	\$3,987	\$7,262	\$7,797		
350%-400%	5	0%	9.5%	\$3,820	\$4,366	\$3,987	\$7,807	\$8,353		
401%+	4	0%	NOT Eligible for Health Exchange Premium Subsidy, Out-of-Pocket Subsidy or Medicaid							
	3,510	100%								
Part A/MAI MCM Cost Range			ACA Impact on Ryan White Part A Medical Services							
Cost Range	Avg Cost	# Clients	* Exchange: 100-400% FPL*, ineligible for Medicaid & employer insurance can receive assistance							
\$0-\$300	\$135	2,223	* Assistance= Premium subsidy reduces premium cost based on a % of income (100% FPL=2% of income)							
\$301-\$600	\$417	910	* Undocumented & lawfully present immigrant w/in 5 years of residency barred from fed benefits							
\$601-\$1,500	\$831	354	* Long transitional period may require Part A medical to be fully funded, at least initially, in FY 2014							
\$1,501-\$6519	\$2,053	22	* Part A medical needed for Undocumented & those not meeting 5-year legal residency requirement							
\$1-\$6,519	\$290	3,509	* PLWHA out of/or never in care may need assistance while being reconnected or connected							
			* Potential need for Part A emergency deductible, copay and premium assistance							
			* ADAP medical deductible, copay and premium assistance will likely be greatly expanded							

FY 2012/13 Scorecard: Part A & MAI Medical Case Management				ELIGIBILITY: HIV+, Broward Resident, <= 300% FPL			
FY 2012/2013 Clinical Quality Management Indicators Data Summary							
EMA Outcomes:				Numerator	Denominator	Achieved	
Indicator 1.1: 100% of clients receive information regarding available services & corresponding eligibility				1,716	1,725	99%	
Indicator 1.2: 80% of new clients achieve initial POC goals by designated target dates				1,475	2,573	57%	
Indicator 2.1: 80% of clients self-report adherence with their prescribing medication regimen				3,136	3,248	97%	
Indicator 2.2: 80% of new client have outpatient medical visits scheduled to occur within 2 weeks of intake				1,590	1,725	92%	
Indicator 2.3: 80% of clients remain enrolled in Medical at time of discharge or episodic status				861	1,314	66%	
National Quality Center (NQC) inCARE Retention Measures							
NQC Retention Measure #1: Gap Measure				Numerator	Denominator	Percent	
Numerator: Patients with no medical visits in the last 180 days of the measurement year				109	1,559	7%	
Denominator Patients with one or more medical visits in the first six months of the measurement year							
NQC Retention Measure #2: Medical Visit Frequency				Numerator	Denominator	Percent	
Numerator: Patients with one or more medical visits in EACH 6 month period of the 24-mos period				770	1,028	75%	
Denominator Patients with one or more medical visits in FIRST 6 month period of the 24-mos period							
NQC Retention Measure #3: Patients Newly Enrolled in Medical Care				Numerator	Denominator	Percent	
Numerator: Patients with one or more medical visits in each 4-month period in the measurement year				135	205	66%	
Denominator Patients newly enrolled w/ medical provider & >=1 visit in 1st 4 mos. of measurement year							
NQC Retention Measure #4: Viral Load Suppression				Numerator	Denominator	Percent	
Numerator: Patients with a viral load <200 at last Viral Load test in the measurement year				1,400	2,095	67%	
Denominator Patients with at least one medical visit in the measurement year							
HAB HRSA HIV Performance Measures							
HAB Performance Measure	Numerator	Denominator	%				
MCM Care Plans	298	2,292	13%				
MCM Medical Visits	2,292	2,292	100%				
Grantee Comments							
Enhance the emphasis on adherence and retention in medical care with a focus on those sub-populations that are not achieving virologic success							

FY 2012/13 Scorecard: Part A Oral Health Care						ELIGIBILITY: HIV+, Broward Resident, <=300%				
Fiscal Year	Part A & MAI Service Allocations			Final Part A & MAI Expenditures				EMA Award		Core Rank
FY	Part A	MAI	Total	Part A	MAI	Total	% change	Total Part A/MAI	% Award	
2012	\$2,623,653	\$0	\$2,623,653	\$2,641,484	\$0	\$2,641,484	0%	\$15,390,658	17.2%	3
2011	\$2,155,150	\$0	\$2,155,150	\$2,635,854	\$0	\$2,635,854	15%	\$15,006,261	17.6%	4
2010	\$2,183,022	\$0	\$2,183,022	\$2,293,381	\$0	\$2,293,381	7%	\$15,395,252	14.9%	3
2009	\$1,455,187	\$0	\$1,455,187	\$2,152,430	\$0	\$2,152,430	47%	\$15,188,452	14.2%	4
2008	\$1,040,526	\$0	\$1,040,526	\$1,463,896	\$0	\$1,463,896		\$15,171,291	9.6%	3
Utilization by Poverty Level			Part A Cost Ranges			Funded Providers				
FPL	PART A Clients		Cost Range	Avg Cost	Clients	Part A	2	Total Clients	# New	% New
	#	%	\$0-\$1,000	\$428	1,945	Part F Funding	Part F Clients	2,751	676	25%
0%-138%	2,074	75%	\$1,001-\$2,000	\$1,350	540	\$234,747	212	Male	Female	Trans.
139%-300%	672	24%	\$2,001-\$3,000	\$2,448	174			71%	28%	1%
301%-400%	12	0%	Over \$3001	\$4,059	102			Black	White	Other
>40%	3	0%	\$0-\$9,326	\$1,403	3,790			49%	51%	0%
	2,761	100%						Hispanic		Haitian
								11%		17%
FY 2012/2013 Clinical Quality Management Indicators Data Summary										
EMA Outcome:								Numerator	Denominator	Achieved
Indicator 1:	90% of caries identified in the initial treatment plan restored upon completion of							257	262	98%
Indicator 2:	90% of patients free of recurrent caries on restorations placed in the initial treatment plan upon exam 6 or 12 months after completion of initial treatment plan							32	61	52%
National Quality Center (NQC) inCARE Retention Measures										
NQC Retention Measure #1: Gap Measure								Numerator	Denominator	Percent
Numerator:	Patients with no medical visits in the last 180 days of the measurement year							91	741	12%
Denominator: Patients with one or more medical visits in the first six months of the measurement year										
NQC Retention Measure #2: Medical Visit Frequency								Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in EACH 6 month period of the 24-mos period							412	545	76%
Denominator: Patients with one or more medical visits in FIRST 6 month period of the 24-mos period										
NQC Retention Measure #3: Patients Newly Enrolled in Medical Care								Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in each 4-month period in the measurement year							45	89	51%
Denominator: Patients newly enrolled w/ medical provider & >=1 visit in 1st 4 mos. of measurement year										
NQC Retention Measure #4: Viral Load Suppression								Numerator	Denominator	Percent
Numerator:	Patients with a viral load <200 at last Viral Load test in the measurement year							652	834	78%
Denominator: Patients with at least one medical visit in the measurement year										
Grantee Comments										
Review the feasibility of establishing a patient navigator component to promote access to, and retention in, oral health care.										

FY 2012/13 Scorecard: Part A Local AIDS Drug Assistance							ELIGIBILITY: HIV+, Broward Resident, </=400%			
Fiscal Year	Part A & MAI Service Allocations			Final Part A & MAI Expenditures				EMA Award		Core Priority Rank
FY	Part A	MAI	Total	Part A	MAI	Total	% change	Total	% of Total	Rank
2012	\$411,109	\$0	\$411,109	\$655,486	\$0	\$655,486	64%	\$15,390,658	4.3%	2
2011	\$622,385	\$0	\$622,385	\$400,827	\$0	\$400,827	-49%	\$15,006,261	2.7%	2
2010	\$926,000	\$0	\$926,000	\$780,125	\$0	\$780,125	-15%	\$15,395,252	5.1%	2
2009	\$1,652,500	\$40,000	\$1,692,500	\$921,396	\$0	\$921,396	-53%	\$15,188,452	6.1%	2
2008	\$4,361,410	\$40,000	\$4,401,410	\$1,932,285	\$39,998	\$1,972,283		\$15,171,291	13.0%	1
Health Insurance Exchange Cost Estimate-Silver Plan (does not include smoking surcharge </=80% premium full cos										
Federal Poverty Level (FPL) Range	PART A/MAI Medical Clients by FPL Range		Annual Premium w/ Subsidy Applied		Out-of-Pocket Cost w/ Subsidy	Total Annual Cost (Premium & Out of Pocket)		Medicaid Expansion		
	#	%	Cost as % of Income	FPL Range		Min	Max			
				Min						Max
0%-99%	1,555	61%	Not Eligible for Premium Subsidy or Out-of-Pocket Subsidy						Eligible	
100%-138%	427	17%	2%	\$230	\$317	\$1,964	\$2,194	\$2,281		
139%-150%	59	2%	3%-4%	\$479	\$689	\$1,964	\$2,443	\$2,653	Not Eligible	
151%-200%	229	9%	4%-6.3%	\$694	\$1,448	\$1,964	\$2,658	\$3,412		
201%-250%	169	7%	6.3%-8%	\$1,455	\$2,298	\$2,975	\$4,430	\$5,273		
251%-285%	73	3%	8%	\$2,307	\$2,620	\$2,975	\$5,282	\$5,595		
286%-299%	10	0%	9%	\$2,958	\$3,092	\$2,975	\$5,933	\$6,067		
300%-349%	20	1%	9.5%	\$3,275	\$3,810	\$3,987	\$7,262	\$7,797		
350%-400%	6	0%	9.5%	\$3,820	\$4,366	\$3,987	\$7,807	\$8,353	NOT Eligible for Health Exchange Premium Subsidy, Out-of-Pocket Subsidy or Medicaid	
401%+	3	0%								
2,551		100%								
Part A Cost Ranges			ACA Impact on Ryan White Part A Medical Services							
Cost Range	Avg Cost	Clients	* Exchange: 100-400% FPL*, ineligible for Medicaid & employer insurance can receive assistance							
\$0-\$100	\$41	1,372	* Assistance= Premium subsidy reduces premium cost based on a % of income (100% FPL=2% of income)							
\$101-\$300	\$181	720	* Undocumented & lawfully present immigrant w/in 5 years of residency barred from fed benefits							
\$301-\$500	\$387	238	* Part A medical needed for Undocumented & those not meeting 5-year legal residency requirement							
\$501-\$4691	\$975	274	* ADAP funding for copay assistance will likely be greatly expanded							
\$1-\$4,690	\$210	2,604	* Potential need for Part A emergency deductible, copay and premium assistance							
FY 12/13 Pharmacy Client Demographics						FY 12/13 Other Funding				
Total Clients	# New	% New	Black	White	Other	Hispanic	Haitian	Source	Clients	Amount
2,551	679	27%	57%	42%	1%	18%	16%	ADAP	3,321	\$19,783,108
				Male	Female	Med CoPay			553	\$456,503
Part A Pharmacy Providers		3	68%		32%	\$20,239,611				

FY 2012/13 Scorecard: Part A Local AIDS Drug Assistance		ELIGIBILITY: HIV +, Broward Resident, <=400% FPL		
National Quality Center (NQC) in CARE Retention Measures				
NQC Retention Measure #1: Gap Measure		Numerator	Denominator	Percent
Numerator:	Patients with no medical visits in the last 180 days of the measurement year	50	802	6%
Denominator:	Patients with one or more medical visits in the first six months of measurement year			
NQC Retention Measure #2: Medical Visit Frequency		Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in EACH 6 month period of the 24-mos period	622	692	90%
Denominator:	Patients with one or more medical visits in FIRST 6 month period of the 24-mos period			
NQC Retention Measure #3: Patients Newly Enrolled in Medical Care		Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in each 4-month period in the measurement year	19	29	66%
Denominator:	Patients newly enrolled w/ medical provider & >=1 visit in 1st 4 mos. of measurement year			
NQC Retention Measure #4: Viral Load Suppression		Numerator	Denominator	Percent
Numerator:	Patients with a viral load <200 at last Viral Load test in the measurement year	700	852	82%
Denominator:	Patients with at least one medical visit in the measurement year			

FY 2012/13 Scorecard: Part A & MAI Mental Health				ELIGIBILITY: HIV+, Broward Resident, <= 300% FPL						
Fiscal Year		Part A & MAI Service Allocations		Final Part A & MAI Expenditures				EMA Award		Core Rank
FY	Part A	MAI	Total	Part A	MAI	Total	% change	Total Part A/MAI	% of Total	Rank
2012	\$274,099	\$95,368	\$369,467	\$332,746	\$84,003	\$416,749	20%	\$15,390,658	2.7%	6
2011	\$229,098	\$95,000	\$324,098	\$257,238	\$88,814	\$346,052	8%	\$15,006,261	2.3%	7
2010	\$259,168	\$95,000	\$354,168	\$239,685	\$79,579	\$319,264	-16%	\$15,395,252	2.1%	5
2009	\$171,168	\$112,408	\$283,576	\$251,035	\$129,476	\$380,511	40%	\$15,188,452	2.5%	6
2008	\$110,238	\$112,408	\$222,646	\$159,392	\$112,121	\$271,513		\$15,171,291	1.8%	6
Part A/MAI Utilization by FPL			Health Insurance Exchange Cost Estimate for Silver Plan							
Federal Poverty Level (FPL)	RW PART A and MAI		Annual Premium w/ Subsidy Applied		Out-of-Pocket Cost w/ Subsidy	Total Annual Cost		Medicaid Expansion		
	# of MH Clients	% of MH Clients	Cost as % of Income	FPL Range						
				Min	Max	Min	Max			
0%-99%	338	67%	Not Eligible for Premium Subsidy or Out-of-Pocket Subsidy						Eligible	
100%-138%	72	14%	2%	\$230	\$317	\$1,964	\$2,194	\$2,281		
139%-150%	11	2%	3%-4%	\$479	\$689	\$1,964	\$2,443	\$2,653	Not Eligible	
151%-200%	36	7%	4%-6.3%	\$694	\$1,448	\$1,964	\$2,658	\$3,412		
201%-250%	28	6%	4%-6.3%	\$1,455	\$2,298	\$2,975	\$4,430	\$5,273		
251%-285%	13	3%	6.3%-8%	\$2,307	\$2,620	\$2,975	\$5,282	\$5,595		
286%-299%	7	1%	9%	\$2,958	\$3,092	\$2,975	\$5,933	\$6,067		
300%-349%	0	0%	9.5%	\$3,275	\$3,810	\$3,987	\$7,262	\$7,797		
350%-400%	1	0%	9.5%	\$3,820	\$4,366	\$3,987	\$7,807	\$8,353	NOT Eligible for Health Exchange Premium Subsidy, Out-of-Pocket Subsidy or Medicaid	
401%+	2	0%								
	508	100%								
Part A/MAI Cost Ranges			ACA Impact on Ryan White Part A Medical Services							
Cost Range	Avg Cost	Clients	* Exchange: 100-400% FPL*, ineligible for Medicaid & employer insurance can receive assistance							
\$0-\$500	\$231	242	* Assistance= Premium subsidy reduces cost based on a % of income (100% FPL=2% of income)							
\$500-\$1,000	\$709	121	* Undocumented & lawfully present immigrant w/in 5 years of residency barred from federal benefits							
\$1,000-\$2,000	\$1,431	116	* Long transitional period may require Part A medical to be fully funded ,at least initially, in FY 2014							
>\$2,001-\$3451	\$2,452	29	* Part A medical needed for Undocumented & those not meeting 5-year legal residency requirement							
\$1-\$3,451	\$1,403	3,790	* PLWHA out of/or never in care may need assistance while being reconnected or connected							
Other Funders			* Potential need for Part A emergency deductible, copay and premium assistance							
Source	Funding	Clients	* ADAP funding for medical deductible, copay and premium assistance will likely be expanded							
Part C	\$16,886	197	RW Part A Funded Providers		Part A/MAI Utilization & Demographics					
Part D	\$115,574	793	Part A = 3	MAI = 2	Total Clients	# New	% New	Black	White	Other
					508	157	31%	37%	62%	1%
					Male	Female	Transgender	Hispanic	Haitian	
					82%	17%	1%	24%	7%	

FY 2012/13 Scorecard: Part A & MAI Mental Health		ELIGIBILITY: HIV+, Broward Resident, <= 300% FPL		
National Quality Center (NQC) inCARE Retention Measures				
NQC Retention Measure #1: Gap Measure		Numerator	Denominator	Percent
Numerator:	Patients with no medical visits in the last 180 days of the measurement year	7	228	3%
Denominator:	Patients with one or more medical visits in the first six months of the measurement year			
NQC Retention Measure #2: Medical Visit Frequency		Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in EACH 6 month period of the 24-mos period	122	141	87%
Denominator:	Patients with one or more medical visits in FIRST 6 month period of the 24-mos period			
NQC Retention Measure #3: Patients Newly Enrolled in Medical Care		Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in each 4-month period in the measurement year	23	28	82%
Denominator:	Patients newly enrolled w/ medical provider & >=1 visit in 1st 4 mos. of measurement year			
NQC Retention Measure #4: Viral Load Suppression		Numerator	Denominator	Percent
Numerator:	Patients with a viral load <200 at last Viral Load test in the measurement year	191	297	64%
Denominator:	Patients with at least one medical visit in the measurement year			
Mental Health Parity and Addiction Equity Act				
This new Federal law requires group health insurance plans (with >50 insured employees) that offer coverage for mental illness and substance use disorders to provide those benefits in no more restrictive way than all other medical and surgical procedures covered by the plan. The Mental Health Parity and Addiction Equity Act does not require group health plans to cover mental health (MH) and substance use disorder (SUD) benefits but, when plans do cover these benefits, MH and SUD benefits must be covered at levels that are no lower and with treatment limitations that are no more restrictive than would be the case for the other medical and surgical benefits offered by the plan.				
Why is the Federal parity law important?				
Eliminates unequal health treatment. This practice has kept individuals with untreated substance use and mental health disorders from receiving critically important treatment services. Providing parity provides insurance coverage for substance use and mental health disorders equally to other chronic health conditions like diabetes, asthma, and hypertension.				
How does the Federal parity law work?				
Improves access to much needed mental health and substance use disorder treatment services through more equitable coverage. Millions of Americans with mental health (MH) and/or substance use disorders (SUD) fail to receive the treatment they need to get and stay well. The lack of health insurance coverage for MH and SUD treatment has contributed to a large gap in treatment services. Improving coverage of MH and SUD services will help more people get the care they need.				

FY 2012/13 Scorecard: Part A and MAI Substance Abuse						ELIGIBILITY: HIV+, Broward Resident, <= 300% FPL					
FY	Part A & MAI Service Allocations			Final Part A & MAI Expenditures				EMA Award		Priority Rank	
Year	Part A	MAI	Total	Part A	MAI	Total	% change	Total Part A/MAI	% of Total		
FY 12	\$355,389	\$400,624	\$756,013	\$319,631	\$399,986	\$719,617	-2%	\$15,390,658	4.7%	7	
FY 11	\$355,389	\$375,000	\$730,389	\$357,755	\$374,931	\$732,686	7%	\$15,006,261	4.9%	8	
FY 10	\$359,861	\$375,000	\$734,861	\$350,277	\$334,750	\$685,027	4%	\$15,395,252	4.4%	6	
FY 09	\$418,861	\$215,268	\$634,129	\$359,824	\$296,393	\$656,217	2%	\$15,188,452	4.3%	5	
FY 08	\$225,861	\$215,268	\$441,129	\$427,801	\$215,193	\$642,994		\$15,171,291	4.2%	9	
FY 2012 Part A and MAI Utilization & Demographics							Funded Providers		FY 2012 Other HIV Funders		
Total Clients	# New	% New	Male	Female	Trans		Part A	MAI	Funder	Amount	Clients
126	44	35%	75%	25%	0.0%		#	#	Part D	\$20,609	27
Black	White	Other	Hispanic	Haitian			2	1	PAC Waiver	\$0	0
53%	45%	2%	11%	2%						\$ 20,609	27
Part A/MAI Utilization by											
Federal Poverty Level (FPL)	RW PART A and MAI		Annual Premium w/ Subsidy Applied			Out-of-Pocket Cost w/ Subsidy	Total Annual Cost (Premium & Out of Pocket)		Medicaid Expansion		
	# of Clients	% of Clients	Cost as % of Income	FPL Range			Min	Max			
				Min	Max						
0%-99%	109	87%	Not Eligible for Premium Subsidy or Out-of-Pocket Subsidy						Eligible		
100%-138%	10	8%	2%	\$230	\$317	\$1,964	\$2,194	\$2,281			
139%-150%	1	1%	3%-4%	\$479	\$689	\$1,964	\$2,443	\$2,653	Not Eligible		
151%-200%	4	3%	4%-6.3%	\$694	\$1,448	\$1,964	\$2,658	\$3,412			
201%-250%	2	2%	4%-6.3%	\$1,455	\$2,298	\$2,975	\$4,430	\$5,273			
251%-285%	0	0%	6.3%-8%	\$2,307	\$2,620	\$2,975	\$5,282	\$5,595			
286%-299%	0	0%	9%	\$2,958	\$3,092	\$2,975	\$5,933	\$6,067			
300%-349%	0	0%	9.5%	\$3,275	\$3,810	\$3,987	\$7,262	\$7,797			
350%-400%	0	0%	9.5%	\$3,820	\$4,366	\$3,987	\$7,807	\$8,353			
401%+	0	0%	NOT Eligible for Health Exchange Premium Subsidy, Out-of-Pocket Subsidy or Medicaid								
	126	100%									
Part A/MAI Cost Ranges			ACA Impact on Ryan White Part A Medical Services								
Cost Range	Avg Cost	Clients	* Exchange: 100-400% FPL*, ineligible for Medicaid & employer insurance can receive assistance								
\$1-\$1,000	\$334	27	* Assitance= Premium subsidy reduces premium cost based on % of income (100% FPL=2% of income)								
\$1k-\$5,000	\$2,559	46	* Undocumented & lawfully present immigrant w/in 5 years of residency barred from Fed benefits								
\$5k-\$10,000	\$6,917	23	* Long transitional period may require Part A medical to be fully funded ,at least initially, in FY 2014								
Over \$10,000	\$12,280	30	* Part A medical needed for Undocumented & those not meeting 5-year legal residency requirement								
\$0-14,901	5,192	126	* PLWHA out of/or never in care may need assistance while being reconnected or connected								
			* Potential need for Part A emergency deductible, copay and premium assistance								
			* ADAP funding for medical deductible, copay and premium assistance will likely be greatly expanded								

FY 2012/13 Scorecard: Part A and MAI Substance Abuse		ELIGIBILITY: HIV+, Broward Resident, <= 300% FPL		
National Quality Center (NQC) inCARE Retention Measures				
NQC Retention Measure #1: Gap Measure		Numerator	Denominator	Percent
Numerator:	Patients with no medical visits in the last 180 days of the measurement year	3	34	9%
Denominator: Patients with one or more medical visits in the first six months of the measurement year				
NQC Retention Measure #2: Medical Visit Frequency		Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in EACH 6 month period of the 24-mos period	16	21	76%
Denominator: Patients with one or more medical visits in FIRST 6 month period of the 24-mos period				
NQC Retention Measure #3: Patients Newly Enrolled in Medical Care		Numerator	Denominator	Percent
Numerator:	Patients with one or more medical visits in each 4-month period in the measurement year	4	7	57%
Denominator: Patients newly enrolled w/ medical provider & >=1 visit in 1st 4 mos. measurement year				
NQC Retention Measure #4: Viral Load Suppression		Numerator	Denominator	Percent
Numerator:	Patients with a viral load <200 at last Viral Load test in the measurement year	41	49	84%
Denominator: Patients with at least one medical visit in the measurement year				
Mental Health Parity and Addiction Equity Act				
<p>This new Federal law requires group health insurance plans (with >50 insured employees) that offer coverage for mental illness and substance use disorders to provide those benefits in no more restrictive way than all other medical and surgical procedures covered by the plan. The Mental Health Parity and Addiction Equity Act does not require group health plans to cover mental health (MH) and substance use disorder (SUD) benefits but, when plans do cover these benefits, MH and SUD benefits must be covered at levels that are no lower and with treatment limitations that are no more restrictive than would be the case for the other medical and surgical benefits offered by the plan.</p>				
<p>Why is the Federal parity law important?</p> <p>Eliminates unequal health treatment. This practice has kept individuals with untreated substance use and mental health disorders from receiving critically important treatment services. Providing parity provides insurance coverage for substance use and mental health disorders equally to other chronic health conditions like diabetes, asthma, and hypertension.</p>				
<p>How does the Federal parity law work?</p> <p>Improves access to much needed mental health and substance use disorder treatment services through more equitable coverage. Millions of Americans with mental health (MH) and/or substance use disorders (SUD) fail to receive the treatment they need to get and stay well. The lack of health insurance coverage for MH and SUD treatment has contributed to a large gap in treatment services. Improving coverage of MH and SUD services will help more people get the care they need.</p>				

FY 2012/13 Scorecard: Part A Legal Services				ELIGIBILITY: HIV+, Broward Resident, </= 300% FPL							
FY	Part A & MAI Service Allocations			Final Part A Expenditures				EMA Award		Support	
Year	Part A	MAI	Total	Part A	MAI	Total	% change	Total Part A/MAI	% of Total	Priority	
FY 12	\$112,426	\$0	\$112,426	\$131,423	\$0	\$131,423	15%	\$15,390,658	0.9%	5	
FY 11	\$112,426	\$0	\$112,426	\$114,444	\$0	\$114,444	3%	\$15,006,261	0.8%	3	
FY 10	\$96,426	\$0	\$96,426	\$111,375	\$0	\$111,375	16%	\$15,395,252	0.7%	5	
FY 09	\$146,596	\$0	\$146,596	\$96,427	\$0	\$96,427	-6%	\$15,188,452	0.6%	3	
FY 08	\$80,360	\$0	\$80,360	\$102,685	\$0	\$102,685		\$15,171,291	0.7%	3	
Part A Utilization by FPL			Part A Cost Ranges			Part A Demographics			Funded Providers		
Federal Poverty Level (FPL) Range	RW PART A		Cost Range	Avg Cost	Clients	Total Clients	# New	% New	Part A = 1		
	# of	% of	\$0-\$300	\$170	108	214	116	54%			
	Clients	Clients	\$300-\$600	\$453	52	Male	Female	Transgender			
	0%-99%	124	58%	\$600-\$1,000	\$755	26	77%	23%			0.0%
	100%-138%	42	20%	Over \$1,000	\$2,071	28	Black	White			Other
	139%-150%	7	3%	\$22-\$4,432	\$558	214	42%	57%			1%
	151%-200%	24	11%				Hispanic	Haitian			
	201%-250%	10	5%				21%	4%			
	251%-285%	3	1%								
	286%-299%	1	0%								
	300%-349%	1	0%								
	350%-400%	0	0%								
	401%+	2	1%								
	214	100%									
FY 2012/2013 Clinical Quality Management Indicators Data Summary											
EMA Outcome: Increased access to benefits for which the clients is eligible							Numerator	Denominator	Achieved		
1.1 70% of clients whose cases are accepted for representation at SS admin Law Judge hearing will win approval of case benefits and/or medical benefits & improving their financial stability							15	15	100%		

FY 2012/13 Scorecard: Part A ELIGIBILITY: Food Bank <= 150% FPL, Emergency Provision (Food Vouchers/Box) <= 151%-300%											
Fiscal Year	Part A & MAI Service Allocations			Final Part A & MAI Expenditures				EMA Award		Support Rank	
FY	Part A	MAI	Total	Part A	MAI	Total	% change	Total Award	% of Total		
2012	\$277,111	\$0	\$277,111	\$591,208	\$0	\$591,208	-34%	\$15,390,658	3.8%	2	
2011	\$363,360	\$0	\$363,360	\$894,790	\$0	\$894,790	-17%	\$15,006,261	6.0%	1	
2010	\$273,035	\$0	\$273,035	\$1,077,795	\$0	\$1,077,795	17%	\$15,395,252	7.0%	1	
2009	\$801,154	\$0	\$801,154	\$921,003	\$0	\$921,003	-29%	\$15,188,452	6.1%	1	
2008	\$583,615	\$0	\$583,615	\$1,301,154	\$0	\$1,301,154		\$15,171,291	8.6%	1	
Part A Utilization & Demographics											
Total Clients	# New	% New	Male	Female	Transgender	Black	White	Other	Hispanic	Haitian	
2,188	577	26%	69%	31%	0.1%	Part A/MAI =	47%	1%	14%	5%	
Part A Utilization by FPL			Part A Cost Ranges			FY 12/13 Other Public Funding			Part A Providers		
Federal Poverty Level (FPL)	RW PART A		Cost Range	Avg Cost	Clients	Source	Funding	Clients	I		
	# of	% of	\$0-\$100	\$49	400	Part B*	\$1,050	5			
	Clients	Clients	\$100-\$250	\$171	751	PAC Waiver*	\$113,515	77			
0%-99%	1,487	68%	\$250-\$400	\$339	679	Total	\$114,565	82			
100%-138%	525	24%	Over \$400	\$429	358	*Home Delivered Meals					
139%-150%	68	3%	\$0-\$9,326	\$1,403	3,790						
151%-200%	62	3%	FY 2012/2013 Clinical Quality Management Indicators Data Summary								
201%-250%	30	1%	EMA Outcome:								
251%-285%	11	1%	Indicator 1:								
286%-299%	1	0%	80% of clients report an improved ability to take medications when food is required								
300%-349%	1	0%	Numerator	Denominator	Achieved						
350%-400%	1	0%	1,507	1,524	99%						
401%+	2	0%	Indicator 2:								
2,188	100%	100% of clients will receive food handling information as indicated by client signature									
		Numerator	Denominator	Achieved							
		1,839	2,280	81%							

FY 2012/13 Scorecard: Part A and MAI Centralized Intake and Eligibility Determination (CIED) ELIGIBILITY: HIV+, Broward Resident											
FY		CIED Service Allocations			CIED Final Expenditures				EMA Award		Support Rank
Year	Part A	MAI	Total	Part A	MAI	Total	% change	Total Part A/MAI	% Total		
FY 12	\$300,000	\$290,957	\$590,957	\$467,438	\$290,943	\$758,381	22%	\$15,390,658	5%	1	
FY 11	\$300,000	\$290,957	\$590,957	\$329,542	\$290,957	\$620,499		\$15,006,261		2	
FY 10	\$384,043	\$290,957	\$675,000	\$87,765	\$0	\$87,765		\$15,395,252		2	
CIED FPL	Clients		Units	Amount	Avg \$	Avg \$	Affordable Care Act Impact by FPL				
</=138%	5,067	76%	43,413	\$521,494	\$103	\$103	If FL Medicaid Expands </=138% FPL* covered				
139- 300%	1,489	22%	12,979	\$155,860	\$105	\$105	Insurance Exchanges: 100-400% FPL* and ineligible for Medicaid and employer insurance can receive assistance to purchase insurance.				
301-400%	62	1%	556	\$6,672	\$108	\$108					
>/= 400%	13	0%	108	\$1,296	\$100	Part A/MAI =1					
Total	6,631	100%	57,056	685,322	\$103		* See Immigration Status Restrictions below				
RW Medical	Cost Range :		Affordable Care Act								
Cost Range	Avg Cost	Clients	Medical Services Coverage								
\$0-\$100	\$67	3,880	* Medical services will be covered for most if FL fully implements ACA * However, If Medicaid is not expanded clients < 100% FPL will not be eligible for AC . * Most legal residents with income >100% FPL required to purchase insurance or pay a penalty * Undocumented & lawfully present immigrant w/in 5 years of residency barred from Fed benefits								
\$100-\$200	\$133	2,467									
\$200-\$300	\$225	261									
>\$301-\$408	\$322	20									
\$0-\$408	\$98.92	6,629									
Utilization & Demographics											
Race	2009	2010	2011	2012	FPL	2009	2010	2011			
Other	226	214	249	82	0-100	4,188	4,317	4,087			
White	2,933	3,169	3,117	3,028	101-200	1,820	2,095	2,193			
Black	3,457	3,733	3,656	3,520	201-300	530	613	649			
Total	6,616	7,116	7,022	6,630	301-400	62	74	79			
Ethnicity	2009	2010	2011	2012	400+	16	17	14			
Hispanic	876	997	1,014	1,034	Total	6,616	7,116	7,022			
Haitian	598	651	696	687							
Gender	2009	2010	2011	2012							
Transgender	22	23	28	32							
Female	1,998	2,110	2,076	1,962							
Male	4,596	4,983	4,918	4,635							
Total	6,616	7,116	7,022	6,629							

FY 2012/13 Scorecard: Part A/MAI Centralized Intake and Eligibility Determination (CIED)								
CIED Referrals	Part A	Other	Total		Enrolled	Applied*	Approved	
Medical	326	16	342	AICP	0	250		
Pharmaceutical	165		165	Medicaid	2,413	10	4	
Oral Health	780		780	Medicare	1,486			
MCM	777		777	Private Insurance				
Mental Health	125		125	Food Stamps	2,851	120	98	
Substance Abuse	14		14	Cash Assistance		2		
Food Bank	774	4	778	Total Unduplicated	3,817	132	102	
Legal Assistance	447		447					
Outreach	33		33					
Medication Copay		23	23					
Transportation		3	3					
Housing		94	94					
Other Services		54	54					
Total	3441	194	3635					
Medical Funding Source								
	2009	%	2010	%	2011	%	2012	%
Private	389	6%	520	7%	569	8%	452	7%
Medicaid/ Medicare	2,511	38%	2,831	40%	2677	38%	2,569	39%
None	3,716	56%	3,765	53%	3776	54%	3,511	53%
Total	6,616	100%	7,116	100%	7022	100%	6,631	100%

FY 2012/13 Scorecard: Part A Outreach ELIGIBILITY: HIV+ , Broward Resident, At Risk Populations HIV+ and not in Medical Care											
Fiscal Year	Part A & MAI Service Allocations			Final Part A & MAI Expenditures				EMA Award		Support Rank	
FY	Part A	MAI	Total	Part A	MAI	Total	% change	Total Part A/MAI	% of Total		
2012	\$67,000	\$0	\$67,000	\$46,846	\$0	\$46,846	-9%	\$15,390,658	0.3%	4	
2011	\$67,000	\$0	\$67,000	\$51,402	\$0	\$51,402	-38%	\$15,006,261	0.3%	4	
2010	\$164,359	\$0	\$164,359	\$82,945	\$0	\$82,945	-63%	\$15,395,252	0.5%	4	
2009	\$414,359	\$382,720	\$797,079	\$221,342	\$0	\$221,342	-68%	\$15,188,452	1.5%	4	
2008	\$244,250	\$382,720	\$626,970	\$468,479	\$232,118	\$700,597		\$15,171,291	4.6%	4	
Part A Outreach Services Utilization & Demographics											
Total Clients	#New	% New	Male	Female	Transgender	Black	White	Other	Hispanic	Haitian	
182	172	95%	85%	14%	2.0%	27%	33%	40%	10%	3%	
Health Insurance Exchange CostEstimate-Silver Plan (does not include smoking surcharge <=/50% premium full cost)PartA Utilization by FPL											
Federal Poverty Level (FPL)	RW PART A		Annual Premium w/ Subsidy Applied		Out-of-Pocket Cost w/ Subsidy	Total Annual Cost (Premium & Out of Pocket)		Medicaid Expansion			
	# Clients	% Clients	Cost as % of Income	FPL Range Min Max		Min	Max				
0%-99%	140	77%	Not Eligible for Premium Subsidy or Out-of-Pocket Subsidy						Eligible		
100%-138%	20	11%	2%	\$230	\$317	\$1,964	\$2,194	\$2,281	Not Eligible		
139%-150%	2	1%	3%-4%	\$479	\$689	\$1,964	\$2,443	\$2,653			
151%-200%	7	4%	4%-6.3%	\$694	\$1,448	\$1,964	\$2,658	\$3,412			
201%-250%	7	4%	4%-6.3%	\$1,455	\$2,298	\$2,975	\$4,430	\$5,273			
251%-285%	3	2%	6.3%-8%	\$2,307	\$2,620	\$2,975	\$5,282	\$5,595			
286%-299%	1	1%	9%	\$2,958	\$3,092	\$2,975	\$5,933	\$6,067			
300%-349%	1	1%	9.5%	\$3,275	\$3,810	\$3,987	\$7,262	\$7,797	NOT Eligible for Health Exchange Premium Subsidy, Out-of-Pocket Subsidy or Medicaid		
350%-400%	1	1%	9.5%	\$3,820	\$4,366	\$3,987	\$7,807	\$8,353			
401%+	0	0%									
	182	100%									
Part A Cost Ranges			ACA Impact on Ryan White Part A Medical Services								
Cost Range	Avg Cost	Clients	* Exchange: 100-400% FPL*, ineligible for Medicaid & employer insurance can receive assistance								
\$0-\$20	\$13	92	* Assitance= Premium subsidy reduces premium cost based on a % of income (100% FPL=2% of income)								
\$21-\$30	\$26	63	* Undocumented & lawfully present immigrant w/in 5 years of residency barred from fed benefits								
\$31-\$50	\$39	16	* Long transitional period may require Part A medical to be fully funded ,at least initially, in FY 2014								
Over \$50	\$76	10	* PartA medical needed for Undocumented & those not meeting 5-year legal residency requirement								
\$0-\$124	\$23	182	* PLWHA out of/or never in care may need assistance while being reconnected or connected								
			* Potential need for PartA emergency deductible, copay and premium assistance								
			* ADAP funding for medical deductible, copay and premium assistance will likely be greatly expanded								

FY 2012/13 Scorecard: Part A Outreach ELIGIBILITY: HIV+, Broward Resident, At Risk Populations HIV+ and not in Medical Care			
FY 2012/2013 Clinical Quality Management Indicators Data Summary			
EMA Outcome: Facilitate client access to medical care and/or MCM	Numerator	Denominator	Achieved
Indicator 1: 80% of new/lost to care clients have Medical or MCM visit w/in 2 weeks of eligibility	8	88	9%
National Quality Center (NQC) inCARE Retention Measures			
NQC Retention Measure #1: Gap Measure	Numerator	Denominator	Percent
Numerator: Patients with no medical visits in the last 180 days of the measurement year	6	25	24%
Denominator: Patients with one or more medical visits in the first six months of the measurement year			
NQC Retention Measure #2: Medical Visit Frequency	Numerator	Denominator	Percent
Numerator: Patients with one or more medical visits in EACH 6 month period of the 24-mos period	4	15	27%
Denominator: Patients with one or more medical visits in FIRST 6 month period of the 24-mos period			
NQC Retention Measure #3: Patients Newly Enrolled in Medical Care	Numerator	Denominator	Percent
Numerator: Patients with one or more medical visits in each 4-month period in the measurement year	8	10	80%
Denominator: Patients newly enrolled w/ medical provider & >=1 visit in 1st 4 mos. of measurement year			
NQC Retention Measure #4: Viral Load Suppression	Numerator	Denominator	Percent
Numerator: Patients with a viral load <200 at last Viral Load test in the measurement year	19	63	30%
Denominator: Patients with at least one medical visit in the measurement year			

Appendix D, Organizational Codes

<i>Organizations</i>	<i>Org_code</i>
AIDS Healthcare Foundation	AHF
Pride Center	PC
FDOH-Broward County	BCHD
FDOH-Tallahassee	FDOH
Broward Regional Health Planning Council	BRHPC
Care Resource	CR
Broward House	Bhse
Children's Diagnostic Treatment Center	CDTC
Minority Development and Empowerment, Inc.	MDEI
Latino Salud	LS
Memorial Hospital	MH
Baptist Health South Florida	BHSF
Broward County-Human Services	BCHS
Broward Community and Family Health Center	BCFHC
Broward Community Foundation	CFB
Broward Health	BH
Broward Partnership for the Homeless	BPH
City of Fort Lauderdale	CFL
Health Council of South Florida	HCSF
Holy Cross Hospital	HCH
Legal Aid Services of Broward County	LASBC
Nova Southeastern University	NSU
Poverello Center	PCTr
United Way of Broward County	UWBC
AIDS Education Training Center	AETC
Broward Sheriff's Office	BSO
Shadowood	SHD

Phone-Based Survey

Introduction and Purpose

This survey is part of a project that is examining the structure and communication patterns of the local public health system in Broward County. The purpose of the project is to determine how organizations in an HIV/AIDS service delivery system coordinate activities, share information, and distribute resources. The result of this survey will be a network map of the HIV/AIDS service delivery system. Therefore, to participate in the survey you are asked to identify yourself with your response. Your answers will remain confidential. Even if you do not respond to the survey, other respondents may identify your organization as one with which it communicates. If you prefer to not appear on the network map, please indicate that preference.

Demographic Information

Name of Organization

Do you agree to participate in this survey?

What is your position/title?

The following four questions ask about HIV/AIDS services in Broward County. Services include clinical prevention and treatment, community-based prevention programs, and support services.

Question

- (1) With which organizations do you share data or information related to HIV/AIDS in Broward County that is generated within your organization (e.g. clinical data, program evaluation studies, epidemiologic data)?
- (2) With which organizations do you refer clients for HIV/AIDS services?
- (3) With which organizations do you provide or receive financial resources (e.g. subcontracting, purchasing of services) for HIV/AIDS services?
- (4) With which organizations do you engage in community health planning activities related to HIV/AIDS services?
- (5) Please name the top three organizations that are the most reliable source of information regarding public health policy issues.
- (6) Please name the top three organizations that are the most effective policy advocates on behalf of HIV/AIDS clients.

CITED LITERATURE

- Bazzoli, G. J., Shortell, S. M., Dubbs, N., Chan, C., and Kralovec, P. (1999). *A taxonomy of health networks and systems: Bringing order out of chaos. (methods)* Retrieved from
- Berry, F. S., and Brower, R. (2005). Intergovernmental and intersectoral management. *Public Performance and Management Review*, 29(1)
- Checkland, P. (1999). *Systems thinking, systems practice*. Chichester, England: John Wiley & Sons, Ltd.
- Checkland, P., and Holwell, S. (1998). *Information systems and information systems*. Chichester, England: John Wiley & Sons, Ltd.
- Cohen, M.S., McCauley, M., and Sugarman, J. (2012). The ethical odyssey in treating HIV treatment as prevention. *Clinical Trials*, 9(3): 340-347.
- Creswell, J. (2014). *Research design: qualitative, quantitative and mixed methods design*. 4th edition. Thousand Oaks, CA: Sage Publications.
- Cruise, P.L. (1997). AIDS services in Florida: who's doing what and who's paying for it? *Journal of Health and Human Services Administration*, 19(3), 257-269.
- Darrow, W., Montanea, J., and Sanchez-Brana, E. (2010). Coalition contract management as a systems change theory for HIV prevention. *Health Promotion Practice*, 11(6), 867-875.
- Goldsmith, S. and Eggers, W. (2004). *Governing by network: The new shape of the public sector*. Washington, D.C. The Brookings Institution
- Granovetter, M. (1985). *Economic action and social structure: the problem of embeddedness*. American Journal of Sociology, 91(3), 481-510.
- Hanneman, R. and Riddle, M. (2005). *Introduction to Social Networks*. Retrieved from: <http://faculty.ucr.edu/~hanneman/nettext/>
- Heaney, M. (2011). *Basics of network analysis*. Proceedings from Fourth Annual Political Networks Conference, Ann Arbor, MI.
- Indyk, D. and Rier, D. (2006). Requisites, benefits, and challenges of sustainable HIV/AIDS system-building. *Social Work in Health Care*, 42(3), 93-110.
- Institute of Medicine. (2011). *For the public's health: The role of measurement in action and accountability*. Washington, D.C.: The National Academies Press.
- Institute of Medicine. (2003). *The future of the public's health in the 21st century*. Washington, D.C.: The National Academies Press.

CITED LITERATURE (continued)

- Institute of Medicine. (1988). *The future of public health*. Washington, D.C.: The National Academies Press.
- Konigsberg, C. (1989). The Broward network for comprehensive care for AIDS: a public health response. *The Journal of the Florida Medical Association*, 75(4), 395-398.
- Kwait, J., Valente, T. and Celentano, D. Interorganizational relationships among HIV/AIDS service organizations in Baltimore: a network analysis. *Journal of Urban Health*, 78(3), 468-487.
- Luke, D. A., and Harris, J. K. (2007). Network analysis in public health: History, methods, and applications. *Annual Review of Public Health*, 28(1), 69-93.
- Mays, G., and Scutchfield, D. (2010). Improving public health system performance through multiorganizational partnerships. *Preventing Chronic Disease*, 7(6)
- Merrill, J., Keeling, J., and Carley, K. (2010). A comparative study of 11 local health department organizational networks. *Journal of Public Health Management and Practice*, 16(6), 564.
- Miles, M. and Huberman, A. (1994). *Qualitative data analysis: an expanded sourcebook*. Thousand Oaks, CA: Sage Publications.
- Mokdad, A., Annet, J., Ikeda, R., and Mai, C. (2010). Public health surveillance for chronic diseases, injuries, and birth defects. In S. Thacker, S. Teutsch, L. Lee and M. St. Louis (Eds.), *Principles & practice of public health surveillance* (pp. 255-274). Oxford, NY: Oxford University Press.
- Mischen, P., Jackson, S. (2008). Connecting the dots: applying complexity theory, knowledge management, and social network analysis to policy implementation. *Public Administration Quarterly*, 32(3), 314-338.
- National Association of County & City Health Officials. (2009). *2008 national profile of local health departments*. Washington, D.C.
- National Association of County and City Health Officials. (2007). *Informatics at local health departments*. Washington, D.C.
- National Association of County and City Health Officials. (2009). *The use of public health informatics to identify and address inequities*. Washington, D.C.
- O'Carroll, P., Yasnoff, W., Ward, M. E., Ripp, L., and Martin, E. (2003). *Public health informatics and information systems* (1st ed.). New York, NY: Springer.
- Osborne, D., and Gaebler, T. (1993). *Reinventing government: How the entrepreneurial spirit is transforming the public sector*. New York, N.Y: Plume.

CITED LITERATURE (continued)

- Patton, Q. (2002). *Qualitative research & evaluation methods*. 3d Edition. Thousand Oaks, CA: Sage Publications
- Pfeffer, J., and Silancik, G. (1978). *The external control of organizations: A resource dependence perspective*. New York, N.Y.: Harper and Row
- Provan, K., Fish, A., and Sydow, J. (2007). *Interorganizational networks at the network level: a review of the empirical literature on whole networks*. *Journal of Management*. 33(3). 479-516.
- Robert Wood Johnson Foundation. *Turning point national excellence collaborative for information technology: Final report of the collaborative*. (2005). Retrieved from www.infotech.net.org/pubs/InfoTechCollaborativeFinalReport.pdf.
- Scott, J. (2000). *Social network analysis: a handbook (2nd ed)*. Thousand Oaks, CA: Sage Publications
- Turnock, B., Barnes, P. (2007). History will be kind. *Journal of Public Health Management and Practice*. 13(4). 337.
- United Nations Educational, Scientific and Cultural Organization. *Concept of governance*. Retrieved from <http://www.unesco.org/new/en/education/themes/strengthening-education-systems/quality-framework/technical-notes/concept-of-governance/>
- Valente, T. (2010). *Social networks and health*. New York, NY: Oxford University Press.
- Varda, D. (2011). Data-driven management strategies in public health collaboratives. *Journal of Public Health Management and Practice*, 17(2), 122.
- Varda, D. M., Chandra, A. D. H., Stern, S. A., and Lurie, N. (2008). Core dimensions of connectivity in public health collaboratives. *Journal of Public Health Management & Practice*, 14(5), E1-E7.
- Wasserman, S. and Faust, K. (2009). *Social network analysis methods and applications*. New York, NY: Cambridge University Press.
- Yin, R. (2003). *Case study research design and methods*. 3d Edition. Thousand Oaks, CA: Sage Publications.

VITA

Geoffrey S. Downie, MPH

POSITION TITLE
Program Manager

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	YEAR(s)	FIELD OF STUDY
Ball State University, Muncie, IN	BS	1987	Natural Resources
Indiana University, South Bend, IN	MPA	2004	Public Administration
University of Illinois-Chicago	DrPH	2017	Public Health

A. Positions and Honors.

Positions and Employment

1988-91 Environmental Technician, LaPorte County Health Department; LaPorte, IN
1991-98 Environmentalist III, Elkhart County Health Department, Goshen, IN
1998-02 Administrator, LaPorte County Health Department; LaPorte, IN
2002-05 Regional Manager, Governor's Commission for a Drug Free Indiana, Indiana Criminal Justice Institute; Indianapolis, IN
2003-05 Development Consultant, Porter-Starke Services (Community Mental Health Center); Valparaiso, IN
2005-12 Program Manager, Public Health Training and Practice Group, Center for the Advancement of Distance Education, University of Illinois at Chicago, School of Public Health
2013-17 Ryan White Part A Program Manager, Palm Beach County (FL) Community Services Department
2017-xx Grants and Planning Administrator, Health Care District of Palm Beach County

Other Experience and Professional Memberships

1992-05 National Environmental Health Association, Registered Environmental Health Specialist
1993-98 Institute for Hazardous Materials Management
1999-04 Board member, Healthy Communities Initiative of LaPorte County (2004 Board Chair)
1999- Indiana Public Health Association
2003- Pi Alpha Alpha, Public Administration Honors Society
2004- American Public Health Association
2016- American Evaluation Association

Honors

2000 Medicine in Public Health Award, Indiana Public Health Association
2001-02 Mid-America Regional Public Health Leadership Institute Fellow
2002-03 Mid-America Regional Public Health Leadership Institute, Mentor

B. Research Support

Illinois Department of Public Health 07/01/05 – present

Mid-America Regional Public Health Leadership Institute

The goal of this project is to deliver leadership training programs to public health agency personnel throughout Illinois, Indiana and Wisconsin.

Role: Program Manager/Project Director

Indiana State Department of Health/Indiana University 07/01/05 – present

Mid-America Regional Public Health Leadership Institute

The goal of this project is to add Indiana teams to the Mid-America Regional Public Health Leadership Institute and to collaborate on distance learning leadership activities.

Role: Program Manager/Project Director

ASPH/CDC

07/01/05 – 2010

Mid-America Regional Public Health Leadership Institute

The goal of this project is to deliver leadership training programs to public health agency personnel throughout Illinois, Indiana and Wisconsin.

Role: Program Manager/Project Director

Illinois Department of Human Services 07/01/05 – 2012

Maternal & Child Health Management Academy/Emerging Leaders Institute

The goal of this project is to deliver leadership and management training for Maternal & Child Health professionals

Role: Program Manager

HRSA

07/01/05 – 2012

Mid-America Public Health Training Center

The goal of this project is to develop competency-based training programs for the public health work force in Illinois and Indiana.

Role: Program Manager

HRSA

07/22/13 – 07/21/2017

Division of Metropolitan HIV/AIDS Programs, Ryan White Part A

Provided primary care and support services to persons living with HIV/AIDS in Palm Beach County, FL. Conducted contract management and quality improvement support for a clinical provider network

HRSA/RAND Corporation

Ryan White Part F, Special Projects of National Significance

Developed a data and service integration project to link homeless persons living with HIV/AIDS with primary care and housing services. Integrated data systems between Ryan White Part A and Housing Opportunity for Persons Living with HIV/AIDS (HOPWA, Dept HUD).