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Contextualizing Performance of Coordinated Care Network of Veteran Services in Virginia

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CONTEXTUALIZING PERFORMANCE OF COORDINATED CARE NETWORK OF VETERAN SERVICES IN VIRGINIA

ABSTRACT

Coordinated care network is an approach to is human service delivery that is recognized to improve client outcomes at a reduced cost. However, general mixed findings on the effectiveness of coordinated care networks warrant research contextualization. This article seeks to discover factors influencing the performance of a coordinated care network delivering social services to veterans and their families. The study provides a contextual analysis of a coordinated care network launched in 2016 in southeastern Virginia for two samples of 1,512 and 375 veterans and their families. Results of the regression analyses indicate that initial progress has been made both in efficiency measured as the amount of days a client's case is open and effectiveness measured as the recorded outcome of a client's case. However, performance was affected by both client's characteristics and types of services requested. Therefore, performance was not uniform across the network of providers. Further, indicators could be enhanced to better capture areas of the network needing improvement. Future research may consider adding performance measures and track it over time and across contextual attributes to confirm the effectiveness and efficiency performance of a coordinated care network.

Keywords: Coordinated care network, performance measurement, veteran services, community service coordination

Contextualizing Performance of Coordinated Care Network of Veteran Services in Virginia

Organizations may seek collaborations and create networks in response to market risks and funding uncertainties, resource limitations, and problem complexities (Armstrong, McDonough, & Savage, 2015; Springer, Sharp, & Foy, 2000). In the context of service provision, coordinated nonprofit efforts are assumed to lead to improvements in client's outcomes as well as achieve organizational efficiency through increased coordination and synchronization of service delivery (Shaw, Rosen, & Rumbold, 2011; Eschenfelder, 2010; Slayton et al., 2015).

Coordinated networks of community resources, integrated service delivery, and wraparound services are all initiatives within a service delivery ecosystem that emphasize collaborative and holistic efforts in addressing complex client needs. Although they all reside on the continuum of service delivery methods, their essence is confined to a specified degree of integration and coordination, which assumes that service providers work together at the community level in a network to achieve more effective and efficient service delivery and improve outcomes for its clients (Provan & Milward, 1995; 2001). Coordinated service networks also address service fragmentation which, among other things, slows the client referral process and produces gaps in services requested.

Although the concept of service coordination in different forms is not new neither to the theory nor the practice of health and human service delivery, analysis of the effectiveness of such programs is mixed (Bautista, Nurjono, Limx, Dessers, & Vrijhoed, 2016; Suter & Bruns, 2009; Alexander, 2014; Stein & Reider, 2009). Generally, the integrated service delivery method is used to achieve a seamless and more effective way to address variable clients' needs to achieve sustained behavioral changes and resolve multiple interconnected issues (Schmied et al., 2010).

Other benefits of coordinated service delivery include additional network services and providers' choices as irrelevant and unnecessary services are removed from the network (Chen, 2008). In other words, it leads to system optimization (Axelsson & Axelsson, 2006).

These benefits have not been systematically confirmed due to associated measurement difficulties. Commonly cited measurement limitations include cross-sectional data and focus on the process and inputs rather than outcomes (Schmied et al., 2010; Bautista et al., 2016; Salliani, Shea, & Levvko, 1994). Therefore, some findings were inconclusive, lacked causality, and generalization. Nevertheless, measurement issues are not the only reason why a coordinated service network may not yield expected results. Where expected outcomes of service integration were not achieved, studies cited low quality of services delivered by individual network providers, lack of resources invested, and insufficient program design, which negatively affected outcomes thus contributing to the lack of consistent impact (Provan, Fish, & Sydow, 2007). Therefore, the ways coordinated networks have been applied in different cases had varying success, thus warranting further investigation (Schmied, et. al., 2010).

Currently, the lack of empirical consensus on the impact of coordinated care networks and integrated services cannot inform better program design and connect it to change in outcomes. Therefore, central question presents, what affects performance of coordinated service networks? This article aims at analyzing one such program to add to the emerging evidence of the benefits of coordinated service networks.

A challenge of generally similar but notably different concepts under the umbrella of collaboration is the conceptual distinction. In some instances, the terms coordinated service network, integrated service delivery, and wraparound services have been used interchangeably, in others their differences were recognized. The next section introduces perspectives on

collaborative and coordinated community service delivery and provides definitions in an attempt to clarify distinctions. Then, a working definition of coordinated service network—the focus of this study—is presented that will guide subsequent methodology and analysis. Lastly, the article concludes with results and proposed practical recommendations to improve coordination, service delivery process, and outcomes.

Literature Review

Definitions

A common challenge of various forms of a single concept is the lack of clear conceptual differentiation among them. Several meta studies on coordinated care and service integration reveal more than a dozen definitions of the concepts (Provan et al., 2007; Armitage, Suter, Oelke, & Adair, 2009). The multitude of definitions can create misconception, which can further obscure the measurement of the concept. Although coordinated service network, integrated service delivery, and wraparound services share a core idea of a collaborative arrangement, it is important to define the boundaries that make them distinct.

In the healthcare literature, integration, and coordination are used interchangeably assuming increased levels of coordination of services (Singer et al., 2011). However, in some studies, patient-centeredness and client involvement were a focus of integrated care and not coordinated service delivery, whereas in others it only pertained to wraparound services (Lloyd & Wait, 2005). For example, Singer et al. (2011) defined integrated care as “patient care that is coordinated across professionals, facilities, and support systems; continuous over time and between visits; tailored to the patients’ needs and preferences; and based on shared responsibility between patient and caregivers for optimizing health” (p.113). Although the above definition

pertains to integrated care, wraparound services have been described similarly. A number of studies defined wraparound services as comprehensive and individualized, client-centered, and family and community-involved approach of continuous care, where client's progress is tracked over time and outcomes are consistently measured (VanDenBerg & Grealish, 1996; Pringle et al., 2002; Sather & Bruns, 2016). This type of service care is usually applied to clients with multiple and complex issues, such as children with emotional and behavioral disorders, substance abuse patients, etc. Further, some definitions focus more on describing the care provided rather than the providers' arrangement. Therefore, definitions vary from study to study depending on the context, implying that there are no conventionally accepted definitions that would consistently differentiate between coordinated, integrated, and wraparound services.

The lack of consistent distinction among the coordination, integration, and wraparound arrangements, however, lies in nuanced details. These nuances can be noted by arranging the concepts along a continuum from less to more embedded service delivery. On one end, there is service coordination that can be organized by a lead-agency or through other means with prior planning among the providers, followed by integrated care where service delivery process is streamlined and integrated into the system of each participating organization, which is followed by wraparound services, which assumes service provision catered towards client's needs and increased involvement of one's family (Schmied et al., 2010; McNamara, 2012).

Based on the above review, coordinated service network, which is a conceptual focus of this study, is defined as a community of local service providers that share vision, measurement outcomes, and communication strategies to ensure seamless service delivery and sustainable impact.

Arrangements

Community-based networks, as understood by Provan and Milward (2001), are a form of organized community-level providers that delivers social and human services by coordinating their work and integrating it at the individual and organizational level. According to the authors, integration can occur at the referral, case management, and programmatic levels to achieve greater effectiveness of service delivery. Atkinson, Jones, and Lamont (2007) suggested that network actors can decide to coordinate at organizational, resource, information, or geographical dimensions, with a reservation that most networks coordinate on several dimensions. For example, coordination can occur at the dimension of exchange of information among organizations or it can go further to combine financial resources in a single shared budget, which will likely involve other shared resources, such as staff, equipment, etc. At the geographical dimension, coordination can engage a network of providers at a single physical location or can assume a single case-management web platform to record, track, and provide services regardless of whether providers share a common physical space.

According to Goodwin (2008), integration can occur at organizational (coordination across units of different organizations), delivery process (operations used to deliver services), and service levels (kinds of services provided). Service delivery integration may also assume vertical or horizontal integration, where vertical integration implies synchronization of arrangements with funders, regulators, or one's contractors, whereas horizontal integration infers coordination with other providers that complement your services.

Therefore, there is a range of approaches towards organization of coordinated networks. Organizations participating in such networks are assumed to be equal players; however, it is not a default option. It is also common to see a lead-organization based network model of service

providers (Provan et al., 2007). For example, funder can contract out services to a single organization that is in turn mandated to establish a network of community service providers to satisfy the requirements of the contract and receive funding (Chen & Graddy, 2010). This can also occur without a funder's mandate. Instead, resource constraints, competition, and other economic forces can motivate a single large provider to coordinate their service delivery with other nonprofits into a complementary network to achieve greater efficiency (Agranoff & McGuire, 2001; Bingham & O'Leary, 2008; Turrini, Cristofoli, Frosini, & Nasi, 2010).

Conceptual Model

United Way South Hampton Roads arrangement follows a lead-organization model. In agency theory terms, United Way is seen as a principal that absorbs potential financial risks of collaboration and protects the capacity of their network providers to ensure smooth service delivery process. The service providers are the agents, and together they function as a network. The productivity and impact of a network's performance are of primary interest to its stakeholders. To ensure network sustainability, the evaluation of effectiveness indicators becomes an integral mechanism for the survival of the service arrangements. Understanding what affects one's effectiveness and efficiency is critical to identifying strategic areas for improving clients' outcomes and overall system performance. Figure 1 presents a conceptual model that contextualizes performance efficiency and effectiveness of the coordinated service network as well as identifies factors influencing performance. Next section describes these in more detail. Consequently, the research question posed in this article explores what affects performance efficiency and effectiveness of a coordinated service network.

[Figure 1 about here]

Conceptual Framework

Measurement of Impact

If the impact of coordination and integration can only be truly captured in a controlled environment, the evidence to confirm it would be limited. Several randomized controlled trials demonstrated positive effects both in efficiency and outcomes; however, these studies were confined primarily to the healthcare field (Curtis, Ronan, & Borduin, 2004). Nevertheless, there is some evidence of the impact of coordinated service networks that are not limited to controlled clinical trials, but it has not been studied consistently to confirm its outcomes. Some findings are mixed, whereas others did not provide any evidence to suggest that a coordinated network of community providers is effective or efficient in service delivery, while other studies yielded positive impact (Agranoff & McGuire, 2001; Provan et al., 2007; Armitage et al., 2009; Suter & Bruns, 2009; Curtis et al., 2004). Finally, Provan & Milward (2001) argued that there is no apparent connection between improved client's outcomes and efficiency gains as a result of service integration.

Features such as client-centeredness and service-customization hinder objective comparison and are resource-intensive, so that measuring resource efficiency may not always be warranted. Moreover, Singer et al. (2011) stated that focus on coordination that assumes automation and optimization creates tension with integration that assumes customization of services. Therefore, the shift in focus from coordination to integration can create a tradeoff of values in the service network.

A recurring trend observed throughout the studies on coordinated care is an effort to integrate fragmented services through such initiatives as co-location, coordination of case management, and purposeful communication across providers. Studies that reported positive

results in clients' outcomes emphasized attention to local providers when integrating services within the community and stressed the importance of coordination and commitment among all the providers (Schmied et al., 2010). According to Rosenheck et al. (2001), the success of community service integration outcomes and service use also depends on whether all services needed for target clients are integrated into single service delivery and accessible to those who need it.

Finally, quality of services provided can thwart the progress made even when the systems are successfully integrated. Rosenheck et al. (2001) suggested that the absence of positive outcomes of integrated service delivery can be a result of the quality of services provided rather than their integrated delivery. Their study suggests that aside from the service quality and effective service integration, environmental and individual factors also affect the outcomes of clients with complex and multiple needs.

Inconsistent findings on coordinated care networks coupled with the lack of clarity among the concepts resulted in the absence of theoretical consensus that could ensure consistent assessment and evaluation of the outcomes. Ultimately, these issues impede not only the advancement of theoretical knowledge, but more importantly improvements in practical application.

Hypotheses

In their overview of the literature on service networks, Provan et al. (2007) concluded that outcome measures of service networks in the health and human service sector tend to focus on multiple dimensions, such as effectiveness, organizational learning, and outcomes themselves, rather than solely on outcomes. They reasoned the need for multiple measures is necessary because nonprofits operate in a complex environment with multiple actors and no simple way to

measure outcomes for their diverse client population and other stakeholders, therefore they rely on multiple indicators: “Ultimately, effectiveness will mean different things to each network and to each sector in which a network exists.” (p.505).

Several measures of service coordination offer a more robust depiction of coordinated community care for clients and their families. The assumption is that several measures can assess performance better without making explicit references to particular structural forms of service delivery than a single measure. Based on the analysis of existing literature on coordinated care, measures of coordinated service network performance generally include efficiency and effectiveness measures, such as time it takes to provide services, recorded outcomes as well as clients’ characteristics, and number and type of services requested, which may affect efficiency and effectiveness measures (Stille, Jerant, Bell, Meltzer, & Elmore, 2005; Peikes, Chen, Schore, & Brown, 2009; Sue, McKinney, & Allen, 1976).

Shaw et al. (2011) inferred that the evaluation of processes and outcomes should include contextual factors such as clients’ demographic characteristics, services requested, as well as providers’ information. These factors may significantly alter outcome results regardless of the efficiencies achieved through integration. Client demographics such as age, race or income are often the data that are captured to examine their relationship with program outcomes. Through descriptive and statistical analyses, these factors may be used to forecast client growth, target specific populations, or reveal biases in service delivery. For example, in a study of a coordinated care alliance for pediatric care, race was a significant factor in reducing hospitalization of children with special needs through assigned case managers (Palfrey et al., 2004). In a coordinated care arrangement to address asthma, women were understood to be more

attentive to personal care needs which resulted in more attention given to men moving forward in the program (Krishnan, et al., 2001).

Limitations of organizational capacity to perform program services may affect their ability to meet program or organizational outcomes. In an integrated network perspective where resources are used to meet outcomes, network outcomes may be easier to attain. One standard measure of network effectiveness is the outcome that is recorded when a client's case is closed.

Hypothesis 1a: The outcome of a client's case will depend on the client's characteristics.

Clients that are seeking permanent housing or full-time employment typically require more than one service to achieve their goals (Pearson, Montgomery, & Locke, 2009; Wong, Park, & Nemon, 2006). However, in a disjointed system of social, health, and human services obtaining more than one service from two or more different providers can cost a client or a family more than the value derived from it. Further, meeting only one need may not lead to retention of the positive outcome that has been temporarily achieved. Ensuring that coordinated care includes a range of services essential to their clients' well-being as well as providers proficient in delivering high quality services is integral to the success of the coordinated service network.

Although having access to all needed services is essential for efficiency gains, not all services are comparable in the mode of their delivery. For example, some services that are required to address chronic health issues such as asthma and other illnesses are more "complex" due to systematic, cultural and environmental factors, whereas other services such as obtaining clothing and household necessities are often easier to access (Evans, Armstrong, & Kuppinger, 1996; Crane-Ross, Roth, & Lauber, 2000). Although there is little empirical data, the literature hints at potential effects of the service type on a client's outcome.

Hypothesis 1b: The outcome of a client's case will depend on the type of services provided.

While client-focused outcomes are important, other indicators of network performance should be produced that are essential to the network's function (Provan, Huang, & Milward, 2009). For example, given that the coordinated care network yields a fee for service model, efficiency measures should be included such as changes in service expenditures (Engelhardt et al., 2006; Peikes, Chen, Schore, & Brown, 2009). However, within the context of coordinated care networks, no studies were found that used the time it took to provide services as a measure of efficiency. The management and organizational literature both documented the usefulness of performance measurement data for network managers (Herman & Renz, 2008; Westover & Wagner, 2010; Moynihan & Pandey, 2010; Pekkola, 2013). This article introduces a duration of a client's case indicator as a measure of efficiency in coordinated care networks. The time it takes from a client's initial case opening to closing is often the data that are not captured or tracked.

Coordinated networks seek to optimize service delivery through aspects of integration, but data maintenance has been a challenge. Although limited, research has shown that within the context of a single organization service delivery, client demographics and various organizational characteristics affect client's treatment duration (Sue, McKinney, & Allen, 1976).

Hypothesis 2a: The number of days it takes to resolve a client's case will depend on the client's characteristics.

The coordinated service delivery literature informs us that there is a myriad of approaches to evaluating the efficiency of network outcomes. For example, in evaluating the efficiency of coordinated service delivery of emergency shelters limited clients' stay time was a

part of their service provision goals. However, the period provided to receive services may range from several days to a multiyear commitment. The complexity of client's needs, type of services requested, and other factors may influence the length of a client's stay (Wong, et al., 2006).

Hypothesis 2b: The number of days it takes to resolve a client's case will depend on the type of services requested.

Finally, efficiency measures of coordinated care networks have been traditionally linked to client-related outcomes (Provan & Milward, 1999; Huang & Provan, 2007). Coordinated care networks have been used to address a variety of chronic and acute illnesses such as diabetes, obesity, and other severe health concerns. In such cases, delivering requested services can be time-sensitive due to the severity of a client's case. Therefore, prompt service delivery can result in sustained positive outcomes. For example, in a study on occupational therapy intervention the duration of treatment predicted clients' outcomes (Kingsley & Mailloux, 2013). This endogenous relationship between efficiency and effectiveness measures of a coordinated care network is reflected in the following hypothesis.

Hypothesis 3: The outcome of a client's case will depend on the number of days it takes to resolve a client's case.

Methods

Program Description

AmericaServes (AmericaServes Transparency Report, 2016) is the initiative of the Institute for Veterans and Military Families at Syracuse University that offers a replicable yet tailored coordinated community care network approach to serve the needs of active military, veterans, and their families collectively. The initiative spans fifteen service domains of

complementary services from basic food and housing services to legal, education, and social enrichment services. It uses a case management platform technology to coordinate the work of a community network of service providers. The client-centered platform allows for referrals to be streamlined between participating organizations to ensure that the clients' needs are addressed. The network of providers is organized around a coordination center, which is usually a community lead-provider of social and human services. All providers abide by data reporting requirements set for the whole network.

This study looks at one such program called Mission United that has been launched by the United Way South Hampton Roads (UWSHR) in 2016 in the southeast region of Virginia. This initiative has been replicated in other states (New York, Pennsylvania, North Carolina, and South Carolina). However, no in-depth empirical analysis has been conducted on the newly launched Mission United program.

The Mission United program provides thirteen out of fifteen types of services of the AmericaServes initiative: Benefits, Clothing and Household Goods, Education, Employment, Foods, Health, Housing and Shelter, Individual and Family Support, Legal, Money Management, Social Enrichment, Transportation, and Utilities. Spiritual Enrichment and Sports and Recreation services are not provided by this program. The Mission United program network includes 37 unique service providers. Several providers in the network offer more than one service adding to 48 provider choices across thirteen services.

Data Description

Since the launch in August 2016 to January 2018 the network served 782 clients with 1,538 cases recorded. Permission was obtained from the UWSHR to use the HIPPA compliant dataset of all the cases recorded in the system as a secondary dataset for analysis. After missing

data were removed, 1,512 cases from October 2016 through January 2018 were used for descriptive analysis (Table 1). A smaller sample of 375 cases was used for multiple and logistic regressions to estimate the effects of clients' demographic characteristics and service information on the client's case duration and outcomes.

[Table 1 about here]

A case is created in the system when a provider in the network accepts a service referral. Each case covers one service request. Therefore, one client can have multiple cases in the system. The duration of each case is reported as one of the network efficiency measures. The dataset provides the information on the top service categories requested, the average amount of services requested per person, number of days it takes on average to match a referral with a provider, accuracy rate with which referrals are matched with providers, service outcomes, and client's characteristics including age, gender, race/ethnicity, military affiliation, marital status, number of children, and household income.

On average the network processed 86 referrals a month. The average time it took to resolve a case was 21 days. This number varies based on the type of service requested, from 42 days for Education services to 3 days for Legal services. The most requested services were Housing and Shelter, followed by Utilities and Food, whereas Social Enrichment services were requested the least number of times. Case outcomes also differed across the service types. For example, Transportation had 95% resolution rate, whereas Education service requests were unresolved 47% of the time and Money Management 54% of the time. Overall, 1,512 service requests were resolved at 73.8% rate.

Variables

For the purposes of hypotheses testing the two dependent variables: outcomes (effectiveness measure) and client's case duration (efficiency measure) were used based on the information recorded in the service network case management system. Outcome variable was measured using three categories: resolved cases (coded as 2), when either a network or out of network provider was able to address client's need; self-resolved (coded as 1), when a client reported to resolve their need on their own; and unresolved (coded as 0), when a client either refused a service, was denied a service, network provider could not contact a client, or no applicable service was available. Client's case duration was measured as a continuous variable in the number of days from the time a network provider accepted a referral to the time an outcome was recorded in the system.

Regarding independent variables, thirteen categories of service types were divided into three groups based on the simplicity-complexity of the service provision. Transportation, Clothing and Household Goods, and Food were labeled as "simple" services since they are basic, clearly defined, and straightforward to provide (coded as 2). The second category labeled "moderate" included Utilities, Individual and Family Support, Legal, Education, and Social Enrichment services. These services were combined under the moderate category because they may have eligibility requirements and are recorded as resolved in the system when referrals are accepted by an organization in or outside of the network, therefore can take longer time to be resolved and their outcomes may not be as readily available (coded as 1). Finally, services such as Employment, Housing and Shelter, Health, Money Management, and Benefits were considered "complex" due to either strict eligibility requirements or a nature of the service that may not yield an immediate result. For example, Employment service request was recorded as

resolved only when or if a client has become employed part- or full-time. The latter category was the baseline for comparison.

The case system also recorded the date when each case was created, which was used as a time variable to track if measures of efficiency and/or effectiveness have improved over time. Client's characteristics included gender, age, military status, race/ethnicity, marital status, number of children, and monthly income. Gender variable was coded as 1 for male and 0 for female. Age was measured as the client's full number of years at the time of the referral. Retiree was coded as a baseline of the military status variable, while veterans were coded as 1, and active duty or reserve statuses were coded as 2. Race/ethnicity variable also had three categories: 0 for Hispanic, Asian, American Indian or Alaska Native, and undisclosed categories, 1 for Black, and 2 for White. Marital status was coded as 0 for single/never married, divorced, and separated, and 1 for married/civil union category. Number of children was recorded as it is, and monthly income was measured as the dollar amount of earnings on average in a month reported by the client. Finally, the duration of a case used in the OLS regression as a dependent variable was also included in the logistic regression as an independent variable to test an endogenous relationship proposed by Hypothesis 3.

Analysis and Results

Correlation and regression analyses were performed to determine what affects case duration and case outcomes. Table 2 presents binary correlation coefficients of all variables used for regression analysis. With some correlations being statistically significant, none of the paired comparisons reached a moderate level of correlation with a cutoff at the .400 value (Evans, 1996). The data was checked to meet the OLS assumptions and no issues of multicollinearity,

non-linearity, heteroscedasticity, or non-normality of error distribution were identified, thus meeting the assumptions for regression analysis.

[Table 2 about here]

The results of the regression analyses are presented in Table 3. OLS and multinomial logistic regression were used to determine what affects case duration (continuous variable) and case outcomes (categorical variable) respectively. For multinomial logistic regression, the focus of the analysis was on the comparison of two outcome categories—resolved (baseline) and unresolved, therefore the comparison of resolved and self-resolved is omitted but available upon request.

[Table 3 about here]

Both models were statistically significant at $p<.001$ level. The OLS regression ($F = 5.24$, $p<.05$) explained about 13% of the variance in the case duration ($R^2=.129$). The model revealed support for hypotheses 1b, 2b, and 3 and partial support for hypotheses 1a and 2a. Results indicated that case duration was significantly and negatively affected by the service type variable. Both cases with "moderate" (B=-6.964) and "simple" (B=-10.838) service requests took less time to be resolved when compared to "complex" service referrals. Date created variable (B=-.020) had a marginally significant negative effect on the case duration, meaning it took slightly less time to resolve cases over time. As for the effect of the client's characteristics, being a male client when compared to a female client (B=-8.331) reduced the referral resolution time on average by eight days. Veteran military status when compared to Active Duty/Reserve (B=13.566) and White compared to Hispanic and other minority ethnic groups (B=10.890) exerted positive effect on the case duration, meaning it took longer to resolve a case for those categories of clients when compared to their baselines.

The multinomial logistic regression model was significant ($\chi^2 = 106.30$, $p<.01$) with four variables reaching statistical significance, which explained about 17% of variance in the case outcome. The positive and significant coefficient for "simple" service type when compared to "complex" suggested an increase of 1.482 in the log odds of resolved outcomes. In other words, "simple" service requests have a higher probability of being resolved than "complex" service requests. The coefficient for date created was -.003, meaning that over time the chances of the case to be resolved by the network decreased, although the change was marginal. There was also minimal support for hypothesis 1a given that only one client demographic variable was significantly associated with the client outcomes. Monthly income had a negative but marginal effect (B=.000) on the outcome probability of being resolved. Finally, case duration was included as a predictor in the logistic regression to test if the time it takes to resolve a case affected case outcome. The model indicated a significant relationship that supported hypothesis 3, which confirmed that the longer it takes to resolve the case, the lower is the probability of it being resolved (B=-.018).

Discussion

The overview and analysis of the Mission United coordinated service network program in Southeastern Virginia revealed that although certain milestones were achieved, further improvements of efficiency and effectiveness as measures of the network performance are needed. Among the notable achievements, the Mission United program's average time to match referral to a provider was 5.36 days, with 21 days to resolve a service request, numbers that are comparable to those in the other AmericaServes networks. However, there are limits to the network capacity that were observed over time when the system was overwhelmed with referrals and consequently took more time to process service requests. Overall, case duration did not yield

any signs of network failure. Although regression results showed improvements in case duration over time, the time effect on outcomes was the opposite, therefore suggesting more efficient but less effective performance over time. However, definitive conclusions should be cautiously derived about the network performance based on only 16 months of data.

Further, stakeholders, particularly the lead agency in a coordinated care network, must be cognizant of appropriate performance measurement indicators that aid in determining the levels of network effectiveness and efficiency. Provan and Milward (1995) provided a framework for network performance indicators that should be linked to three levels of analysis: patient, organizational, and community. This study includes several variables that help to gauge levels of efficiency and effectiveness. When measuring efficiency, the results indicate that the type of service, gender, military status, and race influenced the number of days a case is open, showing support for hypotheses 1a and 1b. Clients' cases that received less complex services had shorter case durations than those that received more complex services. This was also the case for clients who were White, male, and veteran. Respectively, when measuring effectiveness, type of service, monthly income, and case duration influenced whether a client's case was resolved or not, showing support for hypotheses 2a, 2b, and 3. The likelihood of a case being resolved depended less on a client's characteristics, but more on how long it took for a case to be resolved and the type of service that was provided. However, only one client characteristic variable, monthly income, was shown to be a significant factor in a case resolution. While case duration was more heavily influenced by a combination of both client and network characteristics, case resolution was more influenced by network characteristics than client characteristics.

The effect of service types was not surprising. More complex services requests took longer time to be resolved and the outcomes of complex service requests had slightly lower

chances of being positively resolved when compared to simple service requests. These findings should be considered when organizations report on their performance. Not all services are comparable, and these objective differences need to be communicated to ensure equal treatment of different services. Certain clients' characteristics affected the efficiency measure, whereas they had almost negligent effect on the measure of effectiveness, suggesting that either certain categories of clients may have requested more complex services, or they constituted a larger portion of the overall number of clients in the network, which lengthened their case resolution time.

Overall, these findings are consistent with past research, further validating that service complexity and client demographics affect client outcomes (Palfrey et al., 2004, Kingsley & Mailloux, 2013). This may also add to the evidence in support of determinants of network effectiveness (Turrini et al., 2010). Stakeholders may find these indicators to be essential in evaluating the network's performance. To be clear, speed is not the goal when measuring a client's case duration or how long it takes for a provider to accept a referral. Rather, these measures may prompt stakeholders into further investigation of a network's design.

Limitations

Several limitations of this study should be noted. First, the data used for the analysis in this article is neither cross-sectional nor time-series. Instead, it contains client's cases recorded over a 16-month period. Although the analysis contained a time-related measure it does not substitute time-series data that is collected over an equally-spaced period from the same subjects. Therefore, any changes in the system recorded over time may have different sources of origin that cannot be captured by the presented research design. Second, the outcomes recorded in the system as resolved sometimes were not as definitive for some types of services compared to the

others. For example, resolved Legal service could mean that a client was referred to a law firm outside of network although it was not clear whether a client was able to resolve their legal issue. Whereas, Transportation service request outcome was straightforward when recorded as resolved, meaning transportation was provided to the client. Therefore, outcome data should be interpreted with caution.

Despite these limitations, the use of a quantitative research design was relevant to answer the research question. The data used in this study were representative of the sample population and provided critical insight into the factors that affect a network's performance. This study may be replicated in a variety of other organizational settings across nonprofit, public, and private sectors. While time series data may not be available for examination, variable substitutes such as date when the case was created used in this study may be used as a proxy in place of it.

Recommendations for Practice

Since the launch of the coordinated service network in August 2016, it is still undergoing changes, more providers are added to the network and further system optimization occurs over time. The UWSHR also plans to expand the network concept to provide services to all their clients regardless of military affiliation, which is a sign that the network service delivery provides advantages that are not achieved otherwise.

Based on the findings the following recommendations were made:

- Based on the effects of service types on outcomes the network should regularly review providers performance and recruit more providers in the service areas of highest demand to proactively respond to the client's needs.

- Based on the time it took on average to resolve a case the network should consider working with providers in the areas where resolution rates are low as well as where it takes longer time to resolve a case.
- Data entry training should be conducted periodically among all network providers, which should stress the importance of timely data entry and consistent entry of outcome results.
- Additional measurement indicators should be added to be able to track clients' outcomes, network efficiency, and clients' characteristics consistently over time.

Conclusions

This study emphasizes the value in further refinement of the conceptual model of the coordinated care network and evaluation efforts. The inclusion of case duration as a network efficiency outcome and predictor of client outcomes contributes to the network performance and measurement literature. In lieu of the nature of used data, practitioners and researchers may consider capturing a client's open and close case dates to examine the association between case duration and other network performance indicators. Theoretical refinement can aid in improving measurement precision of coordinated efforts and consequent outcomes. This, in turn, may advance the practice of coordinated care network, which will perpetuate the flow of information that can be analyzed to make more informed decisions about coordinated service delivery. Future work needs to focus on solutions that address the fragmentation of services and the measured impact of integration that can be directly tied to the improvements in the processes of service delivery.

More broadly, this research continues a search of answers on how to overcome the fragmentation of social and human services in the nonprofit sector, better understand how such

system works, and enhance leveraging existing community resources while filling the gaps in needed services. In order to address fragmentation, researchers need to focus on the performance of coordinated service network that is two-fold: efficiencies of the system itself and the impact of the system improvements on clients' outcomes. Both are essential to achieving the success of coordinated care network initiatives.

A coordinated service network is charged with meeting clients' service demands through better coordination and communication among service providers. It is important to lay out the details of integration prior to implementation, such as be prepared to coordinate teams and resources, draw contingent connections across services, and uniformly train staff across agencies. Whether partnering organizations worked together before or not, essential next steps leading to coordinated service delivery should be in place prior to the network launch. There is no single model of coordinated care network that meets all needs and can fit any circumstances. In order for it to work, organizations need to commit to a well-developed plan that is adapted to their specific settings, clients, and other needs, and be ready to adjust it after the launch.

There is a shortage of evidence-based research on the impact of the coordinated service network. Some studies are limited in their generalizability, other studies have used generic measures that are not conclusive, yet others have conducted clinical trials that are not always feasible to replicate. Future studies should methodically unravel what works, for whom, and under what circumstances. Since coordinated service network model is still undergoing its development, evaluation can facilitate continuous refinement of its framework.

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Figure 1. Conceptual Model of Coordinated Service Network

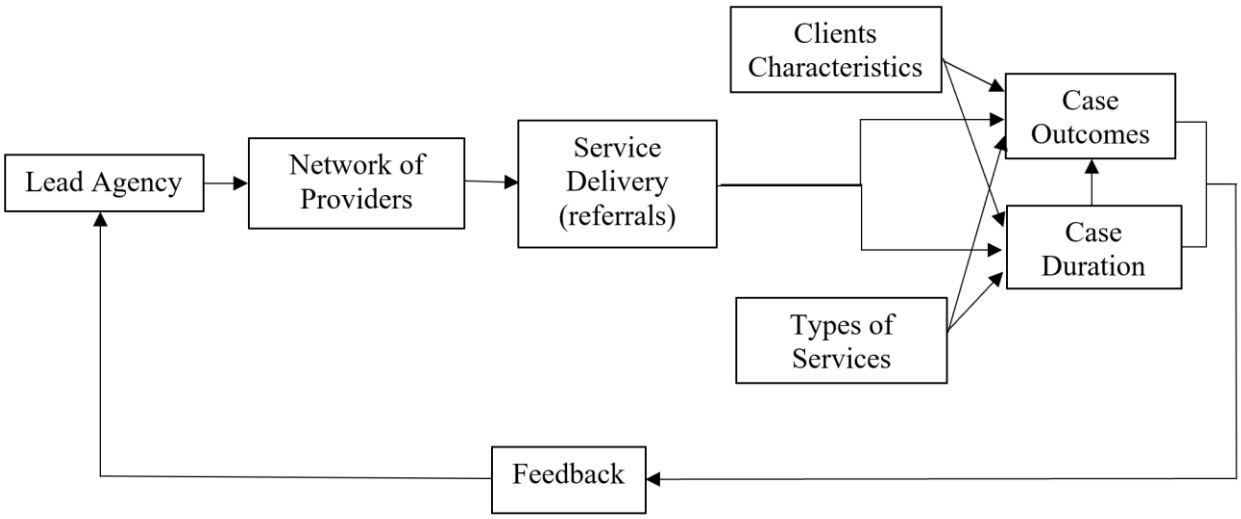

Table 1. Descriptive Statistics

	N	Min	Max	Mean	St.D.
Case Outcome	1,512	0	2	1.398	.022
Case Duration	1,512	0	211.13	27.013	.854
Service Type	1,512	0	2	.842	.021
Date Created	1,512	10/01/16	01/31/18	-	-
Gender	1,512	0	1	.65	.012
Age	1,512	20	88	47.898	.341
Military Status	1,512	0	2	.965	.010
Race / Ethnicity	1,512	0	2	1.179	.015
Marital Status	1,512	0	2	.997	.021
Children	1,512	0	8	.505	.031
Monthly Income	375	0	7,600	1,587.091	52.378

Table 2. Bivariate Pearson Correlation

	Case Outcome	**Case Duration**	**Service Type**	**Date Created**	**Gender**	**Age**	**Military Status**	**Race / Ethnicity**	**Marital status**	**Children**	**Monthly Income**
Case Outcome	1										
Case Duration	-.255**	1									
Service Type	.212**	-.220**	1								
Date Created	-.145**	-.024	.049	1							
Gender	.074**	-.061*	.097**	.003	1						
Age	.089**	-.048	.138**	-.057*	.335**	1					
Military Status	-.007	-.006	.008	.001	-.057*	-.250**	1				
Race / Ethnicity	.012	-.003	-.043	.013	.030	-.004	-.076**	1			
Marital Status	-.007	-.001	-.046	-.032	.015	-.082**	-.039	.115**	1		
Children	-.039	.037	-.037	.178**	-.226**	-.220**	-.007	.028	.181**	1	
Monthly Income	-.184**	.122*	-.067	.007	-.077	-.127**	-.282**	.044	.193**	.189**	1

p<.000, * sig. at .05, ** sig. at .01.

Table 3. OLS and Multinomial Logistic Regression Analyses

	Case Duration	**Case Outcome**
Service Type		
Moderate	-6.964**	.259
Simple	-10.838***	1.482***
Date Created	-.020*	-.003***
Gender	-8.331**	-.354
Age	.022	.015
Current Status		
Veteran	13.566**	.229
Active Duty/Reserve	9.773	.310
Race/Ethnicity		
Black	5.560	.412
White	10.890**	.620
Marital Status	4.608	.277
Children	.144	-.018
Monthly Income	.002	-.000***
(Case Duration)		-.018***
Constant	433.730**	57.429***
	Adj. R^2 = .129 F =5.24***	Pseudo R^2 =.171 Chi^2 =106.30***

Sample size = 375; p<.000, * sig. at .10, ** sig. at .05, ***sig. at .01