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Impact of a State Evidence-Based Practice Legislative Mandate on County Practice
Implementation Patterns and Inpatient Behavioral Health Discharge

by

Carl William Foreman

A dissertation submitted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy
in
Health Systems and Policy

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Portland State University
2015

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Abstract

Evidence-based Medicine (EBM) and Comparative Effectiveness Research (CER) are salient topics in healthcare. The evidence-based framework and terminology has been collectively applied to fields such as criminal justice, child welfare, behavioral health, and management (Sherman, 2002; Aarons & Palinkas, 2007; Rapp, Bond, Becker, Carpinello, Nikkel, & Gintoli, 2005; Rieckmann, Kovas, Fussell, & Stettler, 2008; Pfeffer & Sutton, 2006). The normative term evidence-based practice refers to interventions demonstrating a general level of accepted efficacy. The evidence-based framework provides a rational mechanism for evaluating and categorizing interventions by the level of supporting evidence. Expected products of this process include an increased clarity in the definition of best practices and a convergence of practices across providers. As a public policy, ensuring the use of evidence-base practices provides a potential rational method for controlling the quality of provider practices. In theory, provider use of evidence-based practices increases the quality of services provided and improves outcomes. The implementation of an evidence-based practice legislative mandate in the State of Oregon provided an opportunity to analyze the county-level implementation patterns of evidence-based practices and their impact on expected outcomes. This study sought to assess whether the implementation and outcome patterns associated with the Oregon policy met the “rational mechanism” expectations implicit to the policy. Study results identify some evidence that the policy yielded “rational mechanism” processes and outcomes, but also indicated that other mechanisms may have influenced implementation patterns and that the evidence of a link between policy and

outcomes is a best inconsistent. Further research on evidence-based policies using definitional and measurement frameworks applied in this study is clearly warranted.

Dedication

I would like to dedicate this dissertation to Stephanie, without your enormous and generous love, support, and tolerance this would never happen. To Laura and Eric, I am excited to see what your future may bring.

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I would like to acknowledge the work of Jon Collins, Ph.D., and all the staff of the State of Oregon Addictions and Mental Health (AMH). In addition, I would like to thank the countless individuals that spend each day providing services to individuals in need from which this research is based. I would also like to thank the talented and dedicated individuals that make up Oregon's Trauma System, especially the staff of Salem Hospital and Kaiser Permanente Hospitals and Outpatient Clinics, Trevor Douglas, and everyone that helped bring me back. I would like to thank Drs. Neal Wallace, Matthew Carlson, Phillip Cooper, Sherril Gelmon, and Jill Rissi for allowing me to get it done. Thanks.

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Chapter One: Introduction

Evidence-based practices are a salient topic in healthcare and public policy. The structure of establishing an evidence-base for practices has been collectively applied to diverse fields such as criminal justice, child welfare, behavioral health, and management (Sherman, 2002; Aarons and Palinkas, 2007; Rapp, Bond, Becker, Carpinello, Nikkel, & Gintoli, 2005; Rieckmann, Kovas, Fussell, & Stettler, 2008; Pfeffer & Sutton, 2006). Ubiquitous application of the term ‘evidence-based’ complicates and obscures underlying variations present in these fields and its application to behavioral health. Most importantly, a distinction in the evaluation of evidence as it directly applies to outcomes is not explicit. For example, evidence-based practices for behavioral health focus on outcomes of a distinct practice or program while evidence-based policy focuses on overall population outcomes. While evidence-based practices operate through the philosophy of empiricism, distinctions exist in the types of evidence-based practices (Hjørland, 2011). The term evidence-based generally refers to the use of evidence to support a course of action. However, there are differing views on the ratio of the use of established evidence compared to practitioner experience in decision-making (McCracken & Marsh, 2008; Doane & Varcoe, 2008; Mantzoukas, 2008; Holmes, Perron, & O’Byrne, 2006). Moreover, there are discrete situations more amenable to an evidence-based approach. For example, the process works best with populations or interventions with a sufficient accumulation of evidence and less effective in areas where there is an insufficient evidence-base or less discrete or more complex situations where it

is difficult to determine or evaluate a single course of action (Culpepper and Gilbert, 1999; De Maeseneer, van Driel, Green, & van Weel, 2003). At its most descriptive, evidence-based interventions, represent a self-contained intervention or program with demonstrated effectiveness. This approach relies on fidelity as an implementation control with an emphasis on replication and results (McHugo, Drake, Whitley, Bond, Campbell, Rapp, et. al., 2007; McGrew, Bond, Dietzen, & Salyers, 1994; Mowbray, Holter, Teague, & Bybee, 2003). One of the challenges of this approach is that while a practice may demonstrate effectiveness with a particular population, it provides several methodological challenges that need to be overcome in order to evaluate the overall effectiveness of the public policy. These challenges relate to the aggregated implementation of practices at functional administrative levels. At this aggregate administrative level, organizational and practice implementation factors as well as the impact on outcomes still need to be evaluated.

The relationship between practice and outcome is a factor of intervention and population characteristics. For example, medication management is a widely recognized evidence-based practice referring to the on-going supervision of patients taking medication (Frey & Rahman, 2003). The target population is larger than a single disease category and therefore the potential impact on total population outcomes is substantial. An evidence-based practice viewed broadly identifies system-level best practices for a process and therefore focuses on population outcomes. However, an examination of the evidence for self-contained individual practices or programs used in the service delivery process does not necessarily have a direct link to its impact on the overall population

level outcomes. Sustained population-level outcomes require the integration of individual evidence-based practices and the interrelationship of these practices in aggregate as a policy. Evaluative databases provide information on practice characteristics that facilitate the categorization of practices into measures with the potential of identifying impact on outcomes.

A critical intermediate step in the integration of evidence-based practices and public policy is the development of indices and measures that aggregate individual practices into comparative groups. This methodological application enhances the development of evidence-based practices as a public policy and increases the ability of policy makers to target the implementation of a constellation of practices towards an identified population outcome. A legislative mandate in the State of Oregon provides the opportunity to analyze the impact of evidence-based practice as a public policy and is the basis for this study.

As a function of its foundation in empiricism, evidence-based practices provide a process for the rational evaluation of practices, which assists in practice selection at the organization or jurisdiction level. At the organizational level, evidence-based practices assist in administrative and clinical decision-making by defining the boundaries for effective practice. As a result, evidence-based practices provide a means for evaluating the quality of services without directly monitoring outcomes. While evidence-based practices establish the range of expected interventions within professional domains, once defined, evidence-based practices transcend these professional domains and represent

criteria potentially suitable for system level quality and resource allocation decisions. The development of measures categorizing groups of practices and characteristics represents the combination of system-level and self-contained models at the organizational level. An expansive literature review captures the jurisdictional and organizational influences that in turn guide the development of the measures used in this study.

Evidence-based practices are a decision-making framework for evaluating practices and allocating resources within healthcare or social services (Shemilt, Mugford, Vale, Donaldson & Marsh, 2010). Evidence-based practices influence the decision-making process in two important related ways. Evidence-based practices standardize services around formalized criteria and thus direct providers toward best practices. A corollary of this process is the establishment of the means for non-professionals to evaluate professional clinical practices and thus increasing the accountability and applicability to public policy. In this manner, evidence-based practices establish a metric for evaluating practices and the rational application of resources. There have been various efforts by government entities to increase provider's use of evidence-based practices to this end.

Several states and the federal government have exercised their role as purchasers of public services to incentivize the use of evidence-based practices from providers (Rapp, Bond, Becker, Carpinello, Nikkel & Gintoli, 2005; Bond, Drake, McHugo, Rapp, & Whitley, 2009). While there are several public policy approaches to encourage the implementation of evidence-based practices, the most involved approach is the legislative

mandate. A legislative mandate represents a regulative policy, which focuses on direct coercion through individual conduct (Lowi, 1972). The State of Oregon instituted a legislative mandate with the expressed intent of decreasing the propensity for crime and the need for psychiatric emergency services with associated reductions in cost (Or. Rev. Stat. § 182.515, 2003). The State of Oregon's effort delivers a critical case example of the institution of a legislative mandate for specific state agencies to purchase evidence-based practices. Critical cases are informative in determining the impact of policy (Eckstein, 1975). Oregon's legislative mandate provides the opportunity to study the implementation of evidence-based policy and a critical case to inform further investigations of evidence-based policy in other jurisdictions. This legislative mandate provides a unique opportunity to assess the implementation of evidence-based practices over time and across local jurisdictions. The goal of this study is to identify implementation patterns that developed for practice groups; potential organization factors that influence these patterns; and determine the impact on inpatient hospital outcomes. The administrative decision by the state behavioral health agency to identify evidence-based practices and track implementation provides the opportunity to analyze county-level organizational outcomes. In a related fashion, Oregon's legislative mandate provides an opportunity to test the allocation of treatment resources according to theoretically expected and therefore rational patterns. In addition, this mandate provides the opportunity to investigate organizational and jurisdictional level factors that influence the implementation of evidence-based practices. This analysis has practical methodological implications particularly residing in the extraction and use of secondary data and measure development. This methodology provides a means for the further

examination of practices and their relationship with outcomes. Value associated with potential policy guidance is amplified when considering that the state legislative mandate also predates a tumultuous period of state and federal policy reform and related interventions. Analysis originating for time points under consideration avoids myriad confounding factors and protects the capability to isolate implementation factors and extrapolation on their potential policy impact. For the purposes of this study, the term behavioral health refers to the provision of mental health and substance abuse services.

In summary, the focus of this research is use Oregon's mandate for evidence-based practices to examine the underlying rational assumptions imbedded in the evidence-based practice framework, develop a methodological basis for the evaluation of the impact of evidence-based practices, and identify influential factors in implementation. In order to obtain a more complete understanding of the impact of the evidence-based practice public policy, the proposed research will develop measures and establish a methodological base for investigating factors that influence evidence-based practice implementation. In addition, this research will determine the impact of the mandate on its intended outcome, inpatient hospital discharges.

Background: Oregon's Legislative Mandate

In 2003, the Oregon legislature mandated five state agencies to monitor and increase the percent of purchased evidence-based practices (Or. Rev. Stat. § 182.525, 2003). The expressed intent of this mandate is decreasing the propensity for crime and

the need for psychiatric emergency services and an associated reduction in cost (Or. Rev. Stat. § 182.515, 2003). The mandate directed these agencies to allocate a quarter of their public funds towards evidence-based practices with an additional 25 % increase each subsequent biennium (Or. Rev. Stat. § 182.525, 2003). While the mandate establishes the rate of practice adoption, the implementation process remains at the discretion of the implementing agency. Despite related efforts at the national level, Oregon's mandate represents one of the first attempts by a state to direct agency use of evidence-based practices (Rieckmann, Bergmann, & Rasplika, 2011). The federal Substance Abuse and Mental Health Services Agency (SAMSHA) started tracking state adoption of select evidence-based practices in Federal Fiscal Year 2004 but did not incorporate a direct mechanism for increasing implementation (Manderscheid, 2006). Since the initiation of Oregon's legislative mandate, several states have attempted to foster the use of evidence-based practices (Reickman, 2008). Despite these efforts, Oregon's legislative mandate remains unique in that it directly requires agencies to purchase evidence-based practices (Reickman, 2008).

This study focuses on the implementation efforts of the Oregon Addiction and Mental Health (AMH), which is currently a division in the Oregon Health Authority (OHA). AMH serves as the state authority for the provision of mental health and substance abuse services to children and adults. AMH developed a stakeholder group, which determined practices that met sufficient criteria for an evidence-based practice. The implementation process allows each state agency to develop definitions for evidence-based practice and AMH defines evidence-based practices as “programs or practices that

effectively integrate the best research evidence with clinical expertise, cultural competence and the values of the persons receiving the services.” (State of Oregon Addictions & Mental Health Division, 2007). This definition of evidence-based practice applied to mental health developed from the established concepts of evidence-based medicine.

Evidence-based Medicine

Guyatt (1991) first used the term ‘evidence-based medicine’ in 1991; however, throughout history, population data has informed clinical practices (Claridge & Fabian, 2005). Contemporary efforts developed from the field of clinical epidemiology link population level epidemiological factors to everyday clinical practices (Sackett, 1969). The most common definition of evidence-based medicine is “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research.” (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). The key aspect of evidence-based medicine is the use of research to inform individual patient care. While the application of evidence-based medicine focuses on clinical guidelines, evidence-based practices, which are associated with behavioral health, focus on the evidence base of a particular program or practice.

Evidence-Based Practices

The term evidence-based practices represent the core concepts of evidence-based medicine applied to more general health and social service-related disciplines (Reynolds, 2000). The American Psychological Association defines evidence-based practices as “the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences” (American Psychological Association, 2005). This definition draws from the theoretical tradition of evidence-based medicine and acknowledges the need for evidence while retaining professional discretion.

Some professions appear to display a greater affinity for evidence-based practices than others (Trinder, 2000). Professional disciplines that have an orientation toward research processes and cumulative research are viewed as more likely to have adopted the core processes which include using quantitative data and research to guide practices (Trinder, 2000, p.14). However, even in professions with the appearance of an orientation towards evidence-based medicine such as cardiology, gaps remain between research efforts and practice (Topol & Nissen, 1995; Turnbull, 2005; Fonarow, Albert, Curtis, Stough, Gheorghiade, Heywood & McBride, et al., 2010).

Behavioral Health Research Gap

The evidenced-based practice mandate originates from a well-documented expressed need for an increased application of research supported interventions in clinical settings (IOM, 1998; Bero, Grilli, Grimshaw, Harvey, Oxman, & Thomson, 1998;

Proctor, Landsverk, Aarons, Chambers, Glisson, & Mittman, 2008). In order to understand the parameters of this perceived gap for the practices and clinical environments analyzed in this study, a survey of the general application of behavioral health related research to practice is analyzed. Given the multidisciplinary nature of behavioral health service delivery, this review spans several professions, clinical settings, and includes non-clinical policy and administration. There are some nuances present in distinct professional explicit language which are acknowledged and incorporated into the literature review to highlight core generalities and enhance identification of potential attributes influencing policy effectiveness.

One example of professional specific and generalist obscure terminology is observed in the attempts to develop professionally relevant framework in the practical psychology literature which differentiates between individual empirically supported and professional practices (Chambless & Ollendick, 2001). Kazdin (2008) distinguishes evidence-based treatments that have produced some type of improvement in randomized controlled trials and evidence-based practices which are clinical practices informed by evidence. Empirically supported practices are effective in clinical research settings; however, these outcomes do not directly transfer to clinical settings (Kazdin, 2008; Newnham & Page, 2010). Contextual factors not related to the level of evidence have a demonstrated influence on the adoption of evidence-based practices (Aarons, Glisson, Green, Hoagwood, Kelleher, & Landsverk, 2012; Aarons & Sawitzky, 2006). For example, the six core practices proven to be effective for persons diagnosed with a Serious and Persistent Mental Illness (SPMI) include identifying prescription parameters,

illness management training, assertive community treatment, family psycho-education, supported employment, and integrated treatment for co-occurring substance abuse and mental health disorders (Drake, Mueser, Torrey, Miller, Lehman, Bond, Goldman, et al., 2000). While research has demonstrated that these practices improve client outcomes, these practices have not been universally implemented (Department of Humans Services, 2000; Leff, Mulkern, Lieberman & Raab, 1994; Lehman & Steinwachs, 1998; Drake, Torrey, & McHugo, 2003). There is a similar lack of implementation of accepted guidelines in clinical settings (Grol, 2001). One contributing factor identified in the field of substance abuse is the ineffectiveness of treatment manuals and workshops in assisting practitioners to gain proficiency in evidence-based practices (Miller, Sorensen, Selzer & Brigham, 2006). As noted earlier, research focuses on specific treatments and tends to provide less guidance in complex practice environments such as general practice in medicine (Culpepper and Gilbert, 1999; De Maeseneer, van Driel, Green, & van Weel, 2003). In order to address the gap between research and practice, professions have broadened the framework of evidence-based practice to be more inclusive of expert opinions and clinical experience (Pearson, Wiechula, Court, & Lockwood, 2007; Barkham & Mellor-Clark, 2003). These efforts assist in the application of evidence-based practices as a public policy. However, there are some distinctions between evidence-based practices and evidence-based policy.

Evidence-Based Policy

Evidence-based policy is a rational model of public policy development that emphasizes the repeated use of research to inform and evaluate policy choice (Nutley, 2002). Several critiques identify the limitations of a strict rational view of the policy-making process (Lindblom, 1959; Cohen, March, & Olsen, 1972; Sanderson, 2002; McCaughey & Bruning, 2010). Despite these critiques, evidence-based policy operates on rational assumptions related to the application of program theory which provides the basis for evaluating program effectiveness within these identified limitations. At its most rudimentary level, effectiveness of a program is determined through an analysis of the impact of interventions on the intended population (Rossi, 1999). This impact is determined through a cause-and-effect analysis of program activities and the intended outcomes (Chen, 1990; Lipsy, 1993). However, a cause-and-effect analysis cannot or may not be able to totally attribute outcomes directly to program interventions. Identified attributes relationship with a condition can rarely be distilled to a single distinct cause-and-effect relationship and are instead effects can be composed of an arrangement of “insufficient but non-redundant part of unnecessary but sufficient condition” (Mackie, 1974). All causal relationships are context dependent which can have varying degrees of influence (Shadish, Cook, & Campbell, 2001). Due to the considerable influence of contextual factors, effects related to program impact represent the probability to impact the outcome (Shadish, Cook, & Campbell, 2001). Despite the limitations of the stringent application of cause-and-effect analysis to determine program effectiveness, this provides a benchmark from which the effectiveness of programs or policies can be determined.

Evidence-based policy therefore requires a robust evaluation of processes and outcomes in order to develop a sufficient understanding of program components and identifying those elements with the highest potential for providing the desired impact in the applied environment.

Statement of the Problem

Evidence-based practices have developed into a prominent tool in public policy (Fielding & Briss, 2006; Nutley, 2000). Despite its increasing application as a means to improve service quality, research is limited on the impact of evidence-based policy on organizational practices or outcomes. In addition, there is limited research on organizational implementation mechanisms and the consequent impact on population level outcomes. This study is designed to investigate and analyze the manifold potential impacts on implementation and outcomes associated with this legislative mandate. This study attempts to develop and execute a methodology for the description and analysis of potential influencing implementation factors and impact on outcomes. At its most fundamental level, evidence-based policy represents a rational public policy with the intended impact of standardizing practices and improving outcomes. However, several challenges have the potential to impinge the implementation process across organizations and impact in-patient outcomes. This study addresses several factors including the convergence of practices based on the level acceptance, and the influence of transaction costs and associated resources.

Purpose and Significance of the Study

There is a need for more knowledge regarding the mechanisms influencing evidence-based practice implementation and its impact when mandated as public policy. This research is necessary to expand the application of evidence-based practices as a

public policy. In the field of addictions, further research addressing the impact related to the implementation of evidence-based practices has emerged as a priority and the intended and unintended consequences of policy mandates as a priority research question (McCarthy, McConnell, & Schmidt, 2009). Beyond the field of addictions, the organizational context is an important factor in successful implementation (Yano, 2008). More research is needed to understand the underlying mechanisms of evidence-based practice implementation.

This study addresses a significant gap in the current understanding of the underlying mechanisms involved in evidence-based practice implementation. The research literature addresses the implementation of evidence-based practices within professional contexts and as a normative goal of organizations. However, this research literature does not address the implementation of a wide-range of evidence-based practices, the likelihood that expected standardization occurs, and its impact on outcomes. The research has yet to address patterns of implementation that transcend across evidence-based practices and the contextual factors that impact the organizational decision to invest in a particular practice. In addition, system-wide variables that assist in evidence-based practice implementation have not been identified (McCarthy, McConnell, & Schmidt, 2009). This study will address the gap in research between implementation and outcomes and add to the understanding of the contextual impact on implementation and inpatient outcomes. Within the larger context of public administration, this study provides a methodology for examining the implementation of evidence-based practice as policy and its impact on select outcomes.

Research Questions

The following research questions assess the impact of the implementation of evidence-based practices on outcomes and the convergence of similar practices across counties. The underlying testable hypotheses and an expanded discussion are in Chapter Three. The unit of analysis for the first research question is county year whereas the second research question applies a practice by year unit of analysis.

Research Question 1: How did implementation of Evidence-Based Practices in Oregon change or standardize over time, in total and by subgroup?

Research Question 2: How did county resource levels influence the implementation of Evidence-Based Practices in Oregon?

Research Question 3: How did evidence-based practice implementation in Oregon relate to county per capita inpatient behavioral health discharges?

Theoretical Framework

A significant amount of the clinical practice and implementation science research has been devoted to the study of evidence-based practice. This literature has developed from the more established evidence-based medicine framework and provides a normative focus on increasing individual provider and organizational level implementation of practices (Aarons & Sawitzky, 2006; Hoffmann, Bennett, & Mar, 2009; Shemilt,

Mugford, Vale, Donaldson, & Marsh, 2010; Fixsen, Naoom, Blase, Friedman, &

Wallace, 2005). A foundation of literature has developed on the organizational adoption of a select number of practices (Isett, Burnam, Coleman-Beattie, Hyde, Morrissey, Magnabosco, Rapp, et al., 2007). The clinical and implementation science literature, categorized more broadly for the purposes of this research as the evidence-based practice literature, informs the use of evidence-based practices in decision-making. This theoretical base of the evidence-based practice implementation informs an analysis the impact on inpatient hospitalizations. However, the implementation science literature does not address specific aspects regarding the effectiveness of the broad implementation of evidence-based practices as a public policy. More specifically, the literature has not addressed the adoption of a wide array of evidence-based practices at the state level over multiple years. The literature also does not provide practical or theoretical guidance on the use of evidence based practices as a policy and its impact on outcomes. In order to address these specific aspects of evidence-based practice implementation, a multi-disciplinarian review of the theoretical literature is required.

The literature on the process of diffusion of innovation and the impact on outcomes developed from seminal works. Roger's (2003) diffusion of innovation theory and related literature addresses the transfer process of practices across organizations and jurisdictions. Donabedian's (1966) health quality theory directs the analysis of the impact of evidence-based practices on health outcomes.

A review of the economic and sociological literature on organizations provides a basis for an appraisal of organizational decisions concerning the selection and adoption of individual evidence-based practices. In particular, this literature informs the analysis of the interaction of organizations and their external environment overtime. This theoretical literature includes institutionalism, neo-intuitionism and an examination of the rationalizing influence of professions. It also encompasses contingency theory, new institutional economics, and transaction cost economics.

Institutionalism and Neo-Institutionalism theory serve to inform an analysis of the relationship between contextual factors outside of an organization and inform the decision to adopt a particular practice. Institutionalism provides a basis for the examination of the impact of culture in organizations. Within the Neo-Institutionalism literature, DiMaggio & Powell (1991) provide theoretical guidance for the examination of social and organizational factors that influence the implementation of innovative practices. Contingency theory guides the consideration of structural changes to conform to the external environment of an organization. This is particularly relevant for the discussion on organizational decisions on the adoption of resource intensive practices in the presence of a legislative mandate.

Transaction Cost Economics informs an analysis of the organizational decision to integrate a particular evidence-based practice. In particular, transaction cost economics addresses the supply of evidence-based practices and the impact on the standardization across counties. Williamson (1985) provides a theoretic base for the analysis of the

transaction costs associated with county implementation of evidence-based practices.

Williamson's theory of Transaction Cost Economics (1981) integrates the broader theoretical literature of economics, organizational, and contract theory that will enrich the scope of the analysis. The economic literature on production efficiency and effectiveness will inform the analysis of the choice of outcome. The analysis will focus on determining significant variation in transaction cost and resource constraints across counties. This research addresses whether the evidence-based practice mandate standardized provider practices as expected and analyzes the underlying reasons for standardization. Evidence-based practices may converge based on variations in the levels of evidence, professional influence, and agency resources.

Organization of the Study

Chapter one provided the introduction, background of the legislative mandate, a statement of the problem, research questions, the purpose and significance of the study, theoretical framework, methodology and limitations of the study, and summary. Chapter two provides a review of the literature that addresses the impact of evidence-based practices on organizations and outcomes including the evidence-based policy literature, Institutionalism and Neo-Institutionalism literature, literature on Contingency Theory, and Transaction Cost Economics literature. Chapter three discusses the methodology for the analysis of data. Chapter four discusses the results obtained from the study. Chapter five provides recommendations for further study.

Summary

Evidence-based practices have developed into important tools in healthcare and policy to address the quality of services. The evidence-based practice framework developed from clinical epidemiology and evidence-based medicine involves the application of research to clinical practices. The need for evidence-based practices developed from an acknowledgement that a gap exists between the practices clinicians use and those identified as best practices. In an effort to address this gap, public policy has attempted to increase practitioner's use of evidence-based practices. One area that has not been investigated is the application of a broad set of practices across a state and its impact on specific outcomes over time. Oregon's legislative mandate provides an opportunity to examine the factors that influence the distribution of practices across counties and the impact on inpatient outcomes. There are limitations in this study related to data availability. As a result of these data limitations, the study is limited to inpatient hospitalizations outcomes. These limitations will be more fully explained in Chapter three.

Chapter Two: Review of the Related Literature

In the last twenty years, evidence-based practices have emerged as a significant quality assurance instrument transcending professions and influencing public policy including legislative mandates for its use. Despite the extensive application, a significant gap in the literature surrounds the impact of state mandating the use of evidence-based practices (McCarthy, McConnell, & Schmidt, 2009). Evidence-based practices application in public policy is linked to their capacity to standardize provider processes with the associated implied impact on outcomes. This capacity is exclusive to the establishment of direct provider performance incentives. Notwithstanding its relevancy, there are numerous potential impacts to mandating evidence-based practices. However, despite research on the implementation of practices, there are several organizational level impacts that have yet to be extensively investigated (Stetler, Ritchie, Rycroft-Malone, Schultz, & Charns, 2009).

This research attempts to extend the analysis of evidence-based practice implementation as a public policy to organizational processes and outcome measures. In order to address a suitable range of public policy and organizational impacts, the literature of several academic fields are reviewed in this chapter. One outcome of this literature review is an examination of critical assumptions underlying the use of evidence-based practices as public policy. In particular, these include assumptions regarding the use of practices and the impact on outcomes and the normalization of provider's intervention selection toward best practices. These assumptions are developed in order to provide a platform for the empirical study. Mechanisms examined in this

research include organizations selecting practices based on their level of authoritative review and thus the external indication of quality, administrative complexity, and the amount of transaction costs associated with practices. However, there may be additional influences on the organizational selection of practices that need to be investigated. In Oregon, contracting with the provider network occurs at the county level (Or. Rev. Stat. §§ 430.630-670). Based on this established structure of Oregon's behavioral health system, the county serves as the unit of analysis of evidence-based practice implementation. This central role of a county as the implementation nexus between state and provider networks demands an investigation of organizational and economic theory to address a sufficient range of potential impact factors. In an effort to encapsulate the full array of potential sources influencing the impact of evidence-based practice implementation and organizational factors influential at the county level, several theoretical literatures will be reviewed.

The central thesis of this study is that a comprehensive evaluation of evidence-based practices as public policy necessitates analysis of the impact on outcomes and the process of selection of practices. In addition, there are a variety of organizational factors that influence standardization and selection of practices. This evaluation informs theoretical and practical implications of evidence-based practices applied as public policy. The goal of this chapter is to review the applied and theoretical literature to identify factors that influence the selection and standardization of practices and its relation to outcomes. These factors can be interpreted through several theoretical and organizational contexts which are explored in this chapter. The context for this broad

literature review is the implementation of evidence-based practices in the State of Oregon.

In 2003, a legislative mandate in Oregon required state funds to be used to purchase a percentage of evidence-based practices. The legislation involved several state agencies including corrections and behavioral health with the intent to reduce the likelihood of an individual to commit a crime or need emergency mental health services (Or. Rev. Stat. § 182.515). This rational application of evidence-based practices as a public policy assumes that the act of mandating evidence-based practices results in providers standardizing practices to those with the greatest likelihood to impact outcomes thus providing the desired results. However, the initial examination of results from the Addictions and Mental Health (AMH) agency indicate that the implementation process over the years resulted in the recognition of 169 interventions as evidence-based practices. This elevated number of accepted practices coupled with the absence of state resources assisting in implementation presents an opportunity to test the rational assumption that mandating interventions will standardize practices and impact outcomes. The ability of Oregon's evidence-based mandate to standardize practices across providers and impact outcomes permit a practical assessment of the evidence-based practice framework and its ability to improve outcomes through the reliance on process measures.

A significant gap exists in the established literature between clinical and conceptual interpretations of evidence-based practices as a state public policy (Goldman, Ganju, Drake, Gorman, Hogan, Hyde, & Morgan, 2001; Cooper & Aratani, 2009; Bruns, Hoagwood, Rivard, Wotring, Marsenich, & Carter, 2008). One of the main reasons for this gap is the complexity associated with monitoring the impact of an array of practices

on state level outcomes and the high degree of variation in implementation between states or localities in a state. In an effort to address this complexity, the implementation focused on an individual state facilitates comprehensive analysis of the potential influential factors. Another factor is a general lack of agreement on common variables and as a consequence specific outcomes to measure (McCarthy, McConnell, & Schmidt, 2009). Oregon's legislative mandate identifies psychiatric emergency services which relate to inpatient hospitalization however, a wide variety of outcomes are equally valid for evaluation (Or. Rev. Stat. § 182.515, 2003). Oregon represents the rational application of evidence-based practices as a state policy and therefore provides a critical study from which the state level implementation of evidence-based practices can be analyzed and inform further study. While specific contextual factors such as the focus on inpatient outcomes will guide the analysis of this study, a broad theoretical literature provides a foundation for an examination of underlying factors that can inform further implementations of evidence-based practices.

In order to cover a wide range of literature, this review is organized in two general sections. The initial section focuses on empirical research and theoretical models specifically related to the implementation of evidence-based policy and practices. This section commences with a review of the application of the evidence-based framework to public policy which is referred to as evidence-based policy. The second section addresses more comprehensive theoretical research that informs an analysis of the local system-level adoption of a wide array of evidence-based practices over multiple years. The implementation of evidence-based practices as a behavioral health public policy attracts the attention of a variety of academic fields. In particular, a substantial base of literature

has developed addressing the organizational implementation of evidence-based practices.

This literature involves several bodies of literature including the developing field of implementation science, traditional behavioral health academic fields, as well as public policy literature.

For the purpose of this review, the more traditional research on health outcomes and innovation is evaluated through the health services research, sociology, and economics literature. In addition to this general evidence-based policy literature, the implementation and diffusion of innovation research provides a context for analyzing the adoption of evidence-based practices across counties. There are several sociological and economic theories that inform an analysis of the standardization of evidence-based practices across organizations. A brief review of the sociology of professions literature provides context into the standardizing elements professions exert on organizations. The sociological and economic literature addressing organizations and their interaction with the external environment will also be reviewed. Contingency theory provides insights into structural changes in organizations as they adapt to the external environment. Transaction Cost Economics addresses the influence of transaction cost and governance structures on the organizational decision to vertically integrate practices (Williams, 1985). The review concludes with Donabedian's (1966) model for determining health quality and provides a framework for the specific mechanism through which evidence-based practices are expected to influence outcomes. The link between structure, processes, and outcomes is essential to determine the impact of evidence-based practice policy and the mechanism in which it operates. The goal of this review is to examine the current research on evidence-based practices and identify areas that expand current

conceptualizations in regards to system outcomes and the standardization of practices

among providers. Figure 2-1 provides a summary table of the literature reviewed in this

chapter and its relation to study.

Figure 2-1: Summary Table

Concept of Interest Variables	Related Measures	Focus of analysis	Proposition	Key References
Evidence-based policy	Process Measure: Evidence-based Practice Implementation Number of practices implemented	Standardization of practices across counties	The use of evidence-based practices as a public policy is based on an assumed impact on provider practices.	Dobrow, Vivek and Upshur, 2004; Harrison, 2002; Upshur, 2001; Pawson, 2002
Diffusion of innovation	Process Measure: Evidence-based Practice Implementation Professional practice indicated for implementation	Standardization of practices across counties	Evidence-based practices represent an innovative practice which are adopted by practitioners and organizations and following a predictable diffusion pattern	Rogers, 2003; Greenhalgh, Robert, Macfarlane, Bate, and Kyriakidou, 2004; Damanpour, 1991; Aarons, Hulburt, and Horwitz, 2011

Institutionalism	<p>Process Measure: Evidence-based Practice Implementation - Broad convergence of practices across counties measured by the implementation of established practices</p> <p>Level of evidence for approved practices</p>	Standardization of practices Inter-organizational influence	Institutions adopt practices based on the level of uncertainty and in response to governmental regulation and other institutions.	DiMaggio and Powell, 1983; Selznick, 1966
Contingency Theory	<p>Process Measure: Evidence-based Practice Implementation - Broad convergence of practices across counties measured by the implementation of established practices</p> <p>The level of evidence for approved practices</p>	Standardization of practices Intra-organizational structural impact	Organizations adapt their structure to changes in the external environment.	Burns and Stalker, 1961/1994; Galbraith, 1973; Donaldson, 2001
<p>New Institutional Economic Theory</p> <p>Transaction Cost Economics</p>	<p>Process Measure: Evidence-based Practice Implementation</p> <p>Administrative complexity is measured by the implementation of practices that</p>	Standardization Organizational selection of practices	Institutions consider the transaction costs of practices prior to implementation.	Alchian and Demsetz, 1972; Akerlof, 1970; Arrow, 1963; Proven and Milward,

	reference the need for a professional for implementation and practices that designate the need for multiple providers or indicate that the practice is a program			1995; Scott, 2000; Williamson, 1985; 2002
Evidence-Based Practice Impact on Outcomes: Structure-Process-Outcome	Outcome Measure: Inpatient Discharges by County	Inpatient Hospitalization	The implementation of evidence-based practices has the potential to impact outcomes.	Donabedian, 1966; Lyons, Howard, O'Mahoney, and Lish, 1997

Evidence-based Policy

The term 'evidence-based' is associated with a variety of public policies related to transparency, accountability, and effectiveness (Cookson, 2005; Testa & Poertner, 2010; Goldman, Ganju, Drake, Gorman, Hogan, Hyde, & Morgan, 2001; Nutley, 2000). The term encapsulates an array of approaches that evaluate evidence with the purpose of informing the policy decision-making process. At the most rudimentary level, evidence-based policies express the potential to clarify best practices and standardize provider interventions across organizations. At its core, evidence-based policy operates on the normative expectation that the selection of public policies is a rational process predominately based on the methodical evaluation of available research with direct links to funding (Kay, 2011). The rational model in which evidence-based practices developed endows these practices with the expectation to impact client outcomes and standardize practices across organizations. This normative expectation assumes that information

available to decision-makers concerning provider practices and their associated

effectiveness is sufficiently complete. However, there is reason to question the quantity

and quality of information available to decision-makers regarding clinical care

(Government Accountability Office, 2011). Evidence-based practices emerged due to

perceived gaps in the transfer of research to practice, poor quality research, practitioner

information overload, and the use of practices not based on research (Trinder, 2000). The

challenge of improving provider practices may be greater than the mere availability of

evidence. One potential explanation is that the expectations of a strict rational model are

not robust enough to address the contextual factors influencing the provision of services

(Dobrow, Goel, & Upshur, 2004). In the implementation of evidence-based practices in

the mental health context, effectiveness is significantly influenced by the context in

which it operates (Schoenwald, 2001; Proctor, Landsverk, Aarons, Chambers, Glisson, &

Mittman, 2009). In addition, the strength of evidence-based practices may not lie in the

ability to empirically improve mental health services but rather in the public idea of

constructing mental health policy on scientific evidence (Tannenbaum, 2003). The

rational approach may be insufficient to explain the complex legal and political

environment in which public behavioral health services operate (Webb, 2001; Corrigan,

2001). One example is that a strict rational model may not be representative of the

general policy development process.

In practice, policy formation occurs through a complicated process involving the

interaction of various actors and agendas (Kingdon, 1984). This complicated process is

influenced by agency differences such as the extent that agencies rely on scientific

evidence compared to other sources (Jennings & Hall, 2012). In addition, policies are

based on conjectures about how programs and the world work (Sanderson, 2002). Based on the complexity of social systems, Sanderson (2002) suggests moderation in any expectations regarding the ability to predict the impact of public policy. Despite agency variations and political constraints, the policy process is expected to express an underlying rationality (Kemmm, 2006; Bogenschneider, & Corbett, 2010). This form of rationality utilizes a more comprehensive concept of evidence than the strict normative rational approach. Evidence for the purposes of policy making can be viewed through three approaches: political, professional, and scientific (Head, 2008). Policies limited to scientific expressions of evidence represent one of the analytic approaches to public policy and provide a circumscribed view of the policy development process. This restricted view provides a limited understanding of contextual factors. However, evidence-based policy can be viewed more broadly. Evidence-based policy is contingent on several factors including the availability of sufficient evidence; integration of evidence into the policy development process, and the extent that practices can generalize to populations or geographical areas (Burchett, Umoquit, & Dobrow, 2011; Green & Glasgow, 2006; Pawson, Wong, & Owen, 2011). Similarly, the evidence-based practice framework encompasses a wide-range of methods and interpretations of evidence a variety of types of evidence which allow it to remain effective at the individual and organizational level (Rycroft-Malone, Seers, Titchen, Harvey, Kitson, & McCormack, 2004). A narrow interpretation of evidence-based practices in behavioral health has the potential to exclude practices with equivalent evidence base (Tanenbaum, 2005). Particular to services with medical and legal constraints, there are many cases where interventions must be provided regardless of the level of evidence. A robust concept of

evidence-based practices is required to address these constraints and accommodate the needs of publically financed behavioral health. The ability of the evidence-based practice framework to sufficiently capture various forms of evidence is a function of the ability to influence outcomes and standardize practices. The subjective interpretation of evidence has been addressed in the general evidence-based policy literature.

Evidence-based policy attempts to rationalize complex processes and guide future practice (Cronje & Fullan, 2003; Kay, 2011). However, at the most basic level, the concept of evidence is subjective, ambiguous and influences an individual's belief in a concept (Achinstein, 2001). There are two distinct models for evidence-based decision-making. The normative model of evidence-based decision-making concentrates on the quality of evidence whereas the practical model of decision-making interprets evidence through its applicability to contextual situations (Dobrow, Vivek, & Upshur, 2004). This distinction can be used to categorize approaches to evidence-based practices and policy. A majority of the criticisms of evidence-based practices and policy focus on limitations related to contextual factors associated with evidence-based practices (Kemmer, 2006; Greenhalgh & Russell, 2009). Additional criticisms address the lack of integration of ethical and moral considerations (Sanderson, 2006). However, these criticisms are directed to the narrowest interpretation of evidence emphasized in the normative model (Dobrow, Vivek, & Upshur, 2004). While this normative orientation has expressed utility in discrete testable clinical events, this utility fades in more ambiguous clinical settings such as present in behavioral health. However, it is exactly these more ambiguous clinical situations where evidence-based decision-making are assumed to provide the greatest guidance to clinicians and therefore in the greatest demand by practitioners and

policy decision-makers (Smith, 1996; Culpepper, 1999; Pawson, Greenhalgh, Harvey, & Walshe, 2005). The clinical application of evidence-based practice requires focusing application to contextual situations (Dobrow, Vivek, & Upshur, 2004; Chiappelli, 2010; Spring, 2008).

Another factor is the degree of implementation and its relationship to outcome. Fixsen, Naoom, Blasé, Friedman, & Wallace (2005) describe a continuum of three levels relates to the intensity of integration: paper implementation refers to situations emphasizing documentation, process which emphasizes alterations to procedure, and performance which requires implementation with an emphasis on the outcomes. Evidence-based practices as they are applied in the State of Oregon appear to represent a paper implementation with counties documenting their accomplishment. Some organizations may provide more extensive completion including process and performance implementation however; this is not a requirement of the mandate. Reliance on paper implementation represents a normative model of evidence-based practice based on the expectation that impacts on outcomes without integrating incentive mechanisms related to outcome. While the prospect remains for an impact on outcomes, no mechanism assists the direct impact on specific outcomes. The State of Oregon did not conduct a check on treatment or program fidelity. For this reason models with limited emphasis on outcomes and context are referred to as normative models in this chapter.

Normative Models of Evidence-based Practices

Normative models assume that evidence accumulates and disseminates in rational manner with limited impact from contextual situations (Mueser, Torrey, Lynde, Singer,

& Drake, 2003; Kazdin, 2008; Olson, 2000; Corrigan, 2001). These models emphasize the levels of evidence and its ability to improve provider practices. An example of a normative application to innovation in healthcare organizations identifies seven practices for healthcare organizations to accelerate the rate of diffusion (Berwick, 2003). The seven practical practices are: find sound innovations, find and support innovators, invest in early adopters, make the activities of early adopters observable, enable reinvention, create the necessary slack for change, and lead by example (Berwick, 2003). These sound general practices serve as guidelines for increasing the use of innovative practices and are applicable to evidence-based practices. However, they serve as normative expectations and are based on the assumption that the innovation will impact outcomes and lead to standardization of practices. One factor that is not fully incorporated into these practical managerial applications is a full acknowledgement of the complexity of the healthcare environment. In these normative models, increasing provider's use of evidence-based practices is assumed to improve outcomes and standardize practices. Taking this logic to its extreme, the main mechanism for increasing outcomes is through a proliferation and development of practices that meet evidence-based criteria. This model has experienced some challenges in its application to real-world clinical events (Grol, 2001; Spallek, Song, Polk, Bekhuis, Frantsve-Hawley, & Aravamudhan, 2010; Forsner, Hansson, Brommels, Wistedt, & Forsell, 2010; Proctor, Landsverk, Aarons, Chambers, Glisson, & Mittman, 2009; Proctor, Knudsen, Fedoravicius, Hovmand, Rosen, & Perron, 2007). Apart from the challenges in implementation, the methodology for evaluating the evidence associated to practices has substantially improved and the next advancement represents incorporating this methodology into performance measurement (Ganju, 2006).

In this rational model, the evaluation of evidence is critical to increasing the quality of practices. In order to fulfill this function, several approaches have been developed that review and determine the level of evidence. The most common methodology is systematic reviews in which the Cochrane Collaboration provides the most established example.

Systematic Reviews and the Cochrane Collaboration

The evidence-based practice framework is dependent on a reliable mechanism for the review and evaluation of evidence. Systematic reviews provide a methodology for the evaluation of evidence and have been used extensively in the field of medicine. These systematic reviews determine the consistency of findings across multiple populations and settings (Mulrow, 1994). The systematic organization, review, and evaluation of research provides one of the most useful tools in establishing the effectiveness of practices and are based on the pioneering work of Archie Cochrane. Cochrane created a general typology of six categories of therapeutic interventions as they relate to research evidence, factoring in the effect of the intervention (Cochrane, 1972/1999, p.30). One particularly functional element in these reviews is the application of a standardized assessment across a range of studies addressing a certain condition. The Cochrane Collaboration uses the PICO assessment criteria to systematically review studies (O'Connor, Green, & Higgins, 2008). PICO stands for Participants, Interventions, Comparisons, and Outcomes and provides a framework for directing relevant clinical questions for the evaluation of randomized controlled trials (Sackett, Straus, Richardson, Rosenberg, & Haynes, 2000). This standardized assessment provides a means for evaluating the most rigorously conducted

studies to determine the level of evidence supporting a treatment or practice which can result in an evaluation of treatment effectiveness.

The Cochrane Collaboration represents a systematic process for evaluation of evidence which has been developed to varying degrees to other efforts to categorize the levels of evidence associated with interventions and program models (National Registry of Evidence-based Programs & Practices, 2011, Community Preventive Services Task Force, 2011; Partners in Information Access for the Public Health Workforce, 2012; National Association of County & City Health Officials, 2012). One example is Substance Abuse and Mental Health Services Administration's (SAMSHA) systematic review of behavioral health practices and programs through the National Registry of Evidence-based Programs & Practices (National Registry of Evidence-based Programs & Practices, 2011). The National Registry of Evidence-based Programs & Practices (NREPP) assesses the quality of research and the readiness for dissemination (National Registry of Evidence-based Programs & Practices, 2011). Voluntarily submitted practices and programs must demonstrate compliance with four minimum requirements which require a positive behavioral outcome, the use of a quasi-experimental design, results published in a publication, and the presence of implementation materials (National Registry of Evidence-based Programs & Practices, 2011). These evaluative databases provide a critical link in the selection of evidence-based practices. The legitimate systematic evaluation of evidence provides a mechanism for standardizing practices across organizations and practitioners. The evaluation of evidence provides one element in the process of improving the intervention selection process for providers. While databases such as the Cochrane Collaboration and NREPP provide an overview for the

review of evidence-based practices, they do not necessarily result in a change in practice selection. The ability to use evidence-based practice reviews to influence practitioner behavior is a factor of the perception of credibility of the evidence by the practitioner among other factors. In particular, for a practice to be selected, it needs to demonstrate methodological rigor, validation and evidence scope (Forbes, King, Kushner, Letourneau, Myrick, & Profetto-McGrath, 1999). However, these characteristics are dependent on profession and clinical environment (Trinder, 2000).

In behavioral health, a variety of professions provide services further complicating efforts toward standardization of practices. For example, the hierarchy of evidence with the emphasis on Randomized Control Trial's (RCT) has been shown to limit the application of evidence-based practices in nursing care where a less empirical reflective practice was determined to be more beneficial (Mantzoukas, 2008). Regardless of the reputation of an evidence-based practice, the effectiveness of the practice is ultimately determined at the individual practitioner level and depends on clinical decision-making (Thompson, Cullum, McCaughan, Sheldon, & Raynor, 2004). One source of potential variation is individual provider interpretation and application of an intervention. Misalignment can result from several sources and organizational factors which are further investigated in this study. The most established evidence-based practice may prove infeasible for a particular clinical episode based on factors external to the diagnosis or program eligibility. Based on the complexity of clinical treatment, there are critical assessments of the application of Randomized Controlled Trials (RCT) in behavioral health settings and its ability to determine effectiveness (Tanenbaum, 2005). One critique of the evidence-based practice framework is that Randomized Controlled

Trials (RCT's) are applied to areas unavailable to this controlled form of clinical research (Mantzoukas, 2008). However, RCT is a specific evaluation that is most applicable to determining specifically defined intervention effects whereas other forms of evaluation not explicitly limited to defined effects may be equally valid (Leach, 2006). The goal of an effective evidence-based practice framework is to utilize a broad enough evaluative structure to incorporate several types of evidence (Leach, 2006). This evaluation represents one of several components to increasing the quality of implemented practices. Contextual factors exert considerable influence on models of evidence-based practices.

Challenges to Normative Models of Evidence-based practices

Evaluation of evidence-based practice presents three general challenges: measuring evidence-based practice, finding consistency across disciplines, and linking evidence with clinical practices including the perspective of the consumer (Trinder, 2000). One particular line of critique focuses on critical theory and the infringement of professional autonomy (Davies, 2003; Wall, 2008; Webb, 2001). Some of these critiques may be attributed to a potential confusion regarding the philosophy of evidence-based practices and the use of evidence-based treatments in a particular profession (Thyer & Pignotti, 2011). There are also critiques on the pedagogy used in teaching evidence-based practices in professional schools (Thomas, Saroyan, & Dauphinee, 2010; Melnyk, Fineout-Overholt, Feinstein, Sadler, & Green-Hernandez, 2008). One of the key challenges in developing administrative decisions on evidence-based practices is the potential difficulty conducting empirical evaluations of the application of evidence-based practices in clinical settings (Rosenberg & Donald, 1995). Additional criticism of

evidence-based decision-making addresses the emphasis placed on certainty through outcomes instead of acknowledging the uncertainty inherent in the system (Klein, 1996). These critiques illustrate the limitations of a rational process that are superimposed over individual subjective and deeply personal medical events. However, while these critiques may illustrate the limitations of rational approaches, they do not counter the judicious application of rational-decision making in clinical and administrative contexts. The limitations only serve to acknowledge the boundaries of any attempt to describe complex and interpersonal environments.

Evidence-based practices as a public policy have also been interpreted within the context of management and administrative control. Harrison (2002, p.468) examines the development of state directed efforts to manage the medical practice in the United Kingdom and characterizes the effort as an application of the scientific-bureaucratic form of medicine. The scientific-bureaucratic approach is hypothesized to be a coping strategy of the state as a means of addressing radical consumerism in medicine (Harrison, 2002). On a less state specific level, evidence can be used to provide accountability to internal or external stakeholders or for improvement efforts (Sanderson, 2002). However, accountability and improvement can be subjectively defined by the stakeholder (Aaron, 1978). Evidence serves as a single element in the decision-making process and the development of a public policy requires a persuasive argument in order to translate evidence into policy (Majone, 1989). Financial constraints, fluctuating time lines, and the experiences of decision-makers to factor into the policy making decision (Elliott & Popay, 2000). An example is the documented use of evaluated program performance as an element in program continuation in the War on Poverty programs (Aaron, 1978).

Even when evidence-based practices are implemented, they have a limited time frame for achieving substantial levels of fidelity (McHugo, Drake, Whitley, Bond, Campbell, Rapp, & Goldman, et al, 2007). Results from a study implementing these practices in eight states noted a moderate to high program fidelity occurring within a 12-month period after which few gains resulted (McHugo, Drake, Whitley, Bond, Campbell, Rapp, & Goldman, et al, 2007). The goal of an evidence-based decision-making framework is to incorporate evidence within a comprehensive decision-making framework that involves a variety of data elements. There are several contextual factors that influence the implementation of evidence-based practices and the standardization of practices across organizations.

Contextual Models of Evidence-based Practices

Based in part on the limitations addressed above, models of evidence-based practice implementation have increasingly focused on contextual factors influencing implementation. Contextual factors can be differentiated into internal and external contextual factors influencing implementation (Dobrow, Vivek & Upshur, 2004). External contextual factors are population or disease specific while internal contextual factors address the purpose of the practice, process and participants (Dobrow, Vivek & Upshur, 2004). In relationship to public policy, the method in which the evidence is used is more important than the definition of evidence (Dobrow, Goel, Lemieux-Charles, & Black, 2006). Simply focusing the discussion on evidence-based practices may result in an improvement in the effectiveness. The process of determining and evaluating evidence can be interpreted within the scientific realism philosophical framework (Pawson, 2002). Scientific realism emphasizes theoretical explanation over prediction

(Keat & Urry, 2011). Whereas prediction is an important element and necessary

component for program effectiveness, the purpose of designating a practice as evidence-based is to facilitate the replication of effective practices. Facilitating successful practice or program replication requires a methodology for reviewing practice characteristics in order to demonstrate a sufficiently general effect. Replication decisions require a sufficient understanding of essential mechanisms assisting in the application in different contexts. This process has been facilitated through authoritative evaluative databases that use standardized assessments for practices. These reviews provide organizations with sufficient information to consider the adoption of a practice. In particular, the successful use of evidence-based policy hinges on the ability of evidence to transcend contextual factors that impact the standardization of practices and outcomes. There are several methodological approaches that standardize the analysis of research and practices.

Methodological Considerations

In order to be sufficiently robust and therefore effective, an evidence-based practice framework must have the capacity to evaluate quantitative and qualitative research as well as general information (Upshur, 2001). In addition, several sources of evidence are needed to improve outcomes in the patient practitioner interaction (Rycroft-Malone, Seers, Titchen, Harvey, Kitson, & McCormack, 2004). A sufficiently robust framework incorporates methods that are seemingly at odds. For example, meta-analysis and narrative analysis are two traditional methods to evaluate the evidence from a wide-range of studies and represent methods for capturing a wide variety of information and incorporate the information into changes in individual practice. Meta-analysis uses

statistical methodologies to conduct an 'analysis of analyses' (Glass, 1976). Narrative

analysis however, involves the analysis of a chain of events or actions that lead to a conclusion which may be conducive to provider adoption of evidence-based practices (Abel, 2004). At the practitioner decision-making level, subjective narrative serves to strengthen the use and interpretation of evidence-based practice (Greenhalgh, 1999).

Combining these approaches in a meta-narrative review methodology provides a means for connecting different bodies of research and disparate results in a form useful to policy makers (Greenhalgh, Macfarlane, Bate, Kyriakidou, & Peacock, 2005). While meta-analysis is a quantitative method and narrative a qualitative method, both rely on similar inherent logic which is representative of the reasoning needed for providing clinical care (Goldthorpe, 2007; Davis, 2004). Another potential methodology is the evaluation of evidence through the use of abductive reasoning in which the most appropriate explanation is determined from the available evidence (Upshur, 2001). One advantage of this methodology is the acknowledgment of the knowledge asymmetry inherent in health care. Abductive reasoning is an iterative process with multiple determinations, each by means of current evidence with the potential of more recent conflicting information resulting in alternative determinations (Upshur, 2001). While this method is conducive to clinical practice, it is more dynamic than necessary for the process of selecting evidence-based practices as a public policy. Pawson's (2002) realist synthesis model is a similar model of determining evidence through the evaluation of varying methods but is more conducive to public policy due to the emphasis on the evaluation of practices rather than the selection of practices in the clinical encounter.

Pawson's (2002) realist synthesis model develops an intermediate approach between traditional meta-analysis and narrative approaches. These models analyze a wide selection of studies and provide guidance to a variety of stakeholder's including clinicians, policy makers, and researchers. Methodological difficulties are present in both models regarding the comparison of studies including the opportunity to introduce risk into randomized trials. This represents a challenge particularly with small sample sizes (Kunz & Oxman, 1998). Pawson's (2002) realist synthesis approach addresses the limitations of the meta-analysis and narrative review approaches. Meta-analysis removes the results from their contextual frame and narrative review over-contextualizes recommendations from the review (Pawson, 2002a, p.179). In order to integrate multiple methodologies, realist synthesis observes causation as a generative and contingent process (Pawson, 2002b). Similar to Upshur's (2001) use of abductive reasoning which attempts to find the explanation that best fits the evidence, Pawson's (2002b) concept of generative causation focuses on influential program and practice elements contingent on population and environmental factors (Pawson, 2002b). In order to conduct an evaluation of evidence, the causation, ontology, and generalization of the program need to be reviewed (Pawson, 2002b). The focus is on the underlying mechanisms that impact outcomes. Pawson (2002b) notes that realist synthesis evaluates the positive and negative evidence and orients around 'families of mechanisms' rather than 'families of interventions'. The evaluation method attempts to establish why and when programs do and do not work across contextual environments rather than just the results of a program in a particular setting. This model provides a framework for the interpretation of positive

and negative outcomes and increases the likelihood of implementing practices in situations and environments where they have the greatest potential for success.

Normative evidence-based policy does not reflect positive and negative results across contextual environments and therefore provides limited guidance regarding the potential success of a program in a new environment. In addition, the act of comparing a practice has the potential of endowing a practice with additional attributes. For example, best practices operate as a collection of a wide range of behaviors that are determined to be effective “given the cost” of the practice (Bardrach, 2003). Cost-effectiveness is assumed based on the determination as a best practice. The challenge presents in determining the actual cost-effectiveness of practices as they relate to a particular implementation context. However, the cost of a practice must be evaluated relative to the effectiveness of the practice. Useful evaluation of practices requires a sufficiently robust analysis of evidence-based practices characteristics. Omission of a specific characteristic results in either the implicit assumption that the factor is evaluated or that the review is not sufficiently pertinent to a specific intervention both of which have the potential to impact the choice of a particular practice.

Potential influence on outcomes

The application of evidence-based practices as a public policy is based on the assumption that implementation will improve outcomes. The mechanism of this implementation process requires the sufficient integration of effective evidence-based practices into individual clinical decision-making. There are several frameworks that address the mechanism for evidence-based practices influence on outcomes (Stetler,

2001; Kazdin, 2008; Kitson, Harvey, & McCormack, 1998). The Stetler Model provides an example of a framework used in the nursing profession incorporating a six phase approach where an individual practitioner evaluates and decides to use and monitor a particular practice and incorporates a mechanism for verifying the quality of services (Stetler, 2001). These models attempt to illustrate that evidence-based practices provide the practitioner or organization with an approved set of practices in which to evaluate and implement. The framework for evaluating evidence and using validated practices transcends individual professions and facilitates an evaluation of effective practices regardless of professional affiliation (Hoffmann, Bennett, & Mar, 2009). Evidence-based practice implementation operates through the communication of evidence-based practice characteristics with the social system influencing the adoption rate (Titler & Everett, 2001). Individual contextual factors also impact the implementation of specific practices. In a national review of state implementation of the five evidence-based practices that have a national consensus, each practice was found to have unique implementation issues related to financing, regulation, leadership, training, and quality (Isett, Burnam, Coleman-Beattie, Hyde, Morrissey, Magnabosco, & Rapp, et al., 2007). This result highlights the level of complexity associated with the implementation of practices in clinical and social service settings.

Complex environments

There are several clinical and administrative critiques and challenges to adapting context to evidence-based decision-making. Publicly financed healthcare operates in a complex policy environment that involves state, federal, local, and non-profit entities

coordinating care and financing for individuals (Walt, Shiffman, Schneider, Murray,

Brugha, & Gilson, 2008; Rich, 1996, p.31). One challenge is that the accumulated research base is not uniformly distributed across client populations, professions, and programs. In the medical field, clinical effectiveness research is more abundant for specialties and less pronounced for general practice (Culpepper & Gilbert, 1999; De Maeseneer, van Driel, Green, & van Weel, 2003; Naylor, 1995). General medical practice occurs in a complex environment where a wide variety of diverse clinical cases can present. In these complex environments, it is difficult to isolate causal factors which in turn limit the application of randomized controlled trials which express high internal validity but low external validity and require deductive application to a target population (Cartwright, 2007). One important challenge in this environment is the ability of evidence to provide clinical guidance regarding the lack of proof for effectiveness or the proof of lack of effectiveness (Van Weel, 1999). This particular information assists in decision-making during the clinical encounter and allows the clinician to assess the risks associated with an intervention.

Clinical guides and other decision-making tools direct practitioner treatment in complex clinical environments (Newman & Tejeda, 1996). However, guidelines are not capable of capturing the idiosyncratic aspects associated with an individual clinical encounter. Individual best practices develop from clinical experience. This evidence referred to as 'practice-based evidence' and allows for best practices to be incorporated into an evaluative framework (Lucock, Leach, Iveson, Lynch, Horsefield, & Hall, 2003; Barkham & Mellor-Clark, 2003). Complex environments require greater integration of evidence-based practices with other measures that provide clinical guidance. The goal is

to establish guidelines to reduce complexity and aid clinician decision-making.

Complexity has the potential to negatively impact treatment. A belief that client's needs are complex has been shown to hinder the implementation of evidence-based practices (Penelope, 2011). Evidence-based practices provide a means to standardize practices and establish a rational framework with the potential to assist clinical decision-making.

Evidence-Based Policy Literature Conclusions

Evidence-based practices can be viewed as normative and contextual models. Normative models focus on determining the level of evidence whereas contextual models emphasize factors that impact the implementation process. There are several critiques of evidence-based decision-making. One critique is based on the unequal accumulation of research across client populations, professions, and programs. Another critique focuses on the application of equivocal evidence and the guidance that evidence-based practice can provide for clinicians that operate in complex environments. One of the difficulties associated with evidence-based practices is the challenge related to determining the effectiveness of evidence-based practices applied in complex or idiosyncratic clinical situations. However, this criticism is addressed through the use of a sufficiently robust framework for evidence evaluation. In order to understand the standardization of evidence-based practices across organizations, Roger's (2003) diffusion of innovation theory illustrates the normative implementation pattern. This theory represents the traditional implementation model for innovative practices. The succeeding section

reviews the application of Roger's model to public policy and its extension to organizational level implementation and complex environments. This section will also review also focuses on contextual influences on the implementation of innovative practices such as evidence-based practices. Before proceeding to the next section, the implications to the study will be reviewed.

Implications for the Study

There are several implications from the evidence-based policy literature for an evaluation of the implementation of Oregon's evidence-based practice mandate. In particular, the literature indicates a complex interaction between the evaluation of evidence and its impact on policy and outcomes. One of the main distinctions is the presence of normative and contextual models of evidence-based practice policy. Oregon's evidence-based practice policy represents a normative model of evidence-based practices based on its emphasis on the collection and interpretation of evidence. The implementation at the Addictions and Mental Health (AMH) agency included the development of a committee that analyzed proposed practices. Proposed practices were then evaluated through an assessment of the associated level of evidence. This model emphasizes the amount of research while leaving discretion to jurisdictions for selecting practices that meet the needs of a particular population or geographic region. Internal and external contextual factors can vary by jurisdiction. The implementation of Oregon's evidence-based mandate for behavioral health addresses the evaluation of practices, but

does not address at the state-level internal contextual factors such as process and participants which the literature has demonstrated to be important (Dobrow, Vivek, & Upshur, 2004). External contextual factors such as population and disease specific factors are not addressed in the legislative mandate. The underlying rational impact on outcomes is assumed to occur through a progressive increase of the number of evidence-based practices resulting in sufficient impact on provider practices and outcomes. This relies exclusively on the number of evidence-based practices in policy, neglecting other factors such as the integration of evidence into the policy development process, and the generalization of practices to local context (Burchett, Umoquit, & Dobrow, 2011; Green & Glasgow, 2006; Pawson, Wong, & Owen, 2011).

However, in Oregon's legislative mandate, counties can implement any of the recognized evidence-based practices. There are several factors that can influence implementation which can be specific to particular practice. A national study of the implementation of the six most established evidence-based practices in mental health demonstrated that each practice demonstrated unique influences on implementation (Isett, Burnam, Coleman-Beattie, Hyde, Morrissey, Magnabosco, & Rapp, et al., 2007). In Oregon, with the adoption of over a hundred practices, the influencing factors would be significantly more pronounced. In order to understand the process of innovative practices transferring from organizations requires a review of the literature on the diffusion of innovations.

Diffusion of Innovation

Roger's theory of the diffusion of innovation (2003) defines diffusion as 'the process in which an innovation is communicated through certain channels over time among the members of a social system.' This broad definition has been applied in a wide variety of research traditions including the adoption of evidence-based practices (Rogers, 2003; Mateo & Kirchhoff, 2009; Proctor, 2004). The process impacts social structures with successful diffusion resulting in an identifiable pattern with distinctive stages (Rogers, 2003, p. 11). The context surrounding the diffusion process significantly impacts implementation success and the process of innovation is communicated through channels to members of a social system (Rogers, 2003). The message communicated regarding a particular innovation impacts the diffusion. For example, the perceived complexity of an innovation has a negative impact on the rate of adoption (Rogers, p.257; Penelope, 2011). Another important characteristic of communication channels is the relationship between the agent of change and the network. The agent of change is most often heterophilous, or different from the rest of the social system (Rogers, p.19). In order for an individual to transfer an innovative technique, there has to be some novel aspect that the innovator brings into the organization. However, it is important to note that communication is most effective when the individuals are similar (Rogers, p.11). This creates a unique balance between an innovator having both heterophilic and homophilic characteristics in relation to the network. The diffusion of innovation represents a mechanism in which practices are implemented and standardized across organizations. While Roger's diffusion of innovation theory (2003) represents a

normative model where innovation is interpreted as a preferred state, the model has been developed in the attempt to distinguish contextual factors. The theory has been applied to public policy, organizational innovation, and the impact of complex systems which will be explored further.

Diffusion of public policy

A robust literature exists on the diffusion of innovations in comparative state policy research. Initial research indicated states were more likely to implement two types of innovative policies; policies originating from legitimate reference group member states and policies addressing internal state concerns necessitating action (Walker, 1969). However, investigation of state adoption of education, welfare, and civil rights legislation revealed the impact of temporal and issue-specific contextual variables in the adoption of innovative legislation (Gray, 1973). More recent research notes that state adoption is a complex process with regional variation, vertical federal influence, and internal pressures that can impact state innovation (Eyestone, 1977). In relation to state educational reforms, increased involvement in the policy network has been shown to increase the likelihood of reaching legislative goals (Mintrom & Vergari, 1998). In all these models, the regional influence of other states played a role in adoption (Walker, 1969; Gray, 1973; Eyestone, 1977; Mintrom & Vergari, 1998).

Additional research has demonstrated the regional influence on the adoption of innovations (Sutherland, 1950; Light, 1978). In a review of the diffusion of small group insurance market reforms in states, diffusion was found to occur in states that had greater resources, a lower insurance rate, and a neighboring state that had implemented a small

group insurance market reform (Stream, 1999). Geographic regions and functional policy areas have been found to be influential to state perception of acceptable sources of innovation (Light, 1978). Further research identified that depending on the policy, the regional influence may be one of many influences that impact the decision to adopt a particular policy (Mooney, 2001). This represents a general trend in the diffusion of innovation literature from general to more discriminating explanations of the pattern of diffusion. Regional influence and internal effects demonstrate an impact on organizational decision-making (Berry & Berry, 1990). Research also notes some mixed regional effects with the presence of policy entrepreneurs (Mintrom, 1997). Policy entrepreneurs represent individuals that champion a cause and therefore influence the adoption of innovative practices. The mixed results highlight the range of contextual and regional factors influencing the implementation of innovations in the public policy environment.

Public policy may represent a different type of intervention when compared to other more tangible innovations. More specifically, public policy may consist of a 'soft' innovation that represents a collection of ideas rather than strict criteria (Lucas, 1983). Ideas can be interpreted differently or adopted in part which has implications for less defined and therefore tangible evidence-based practices. Lacking fidelity instruments with sufficient integrity, evidence-based practices can represent 'soft' innovations which can be implemented in part or misinterpreted.

In addition to misinterpretation, states may imitate the policy of other states. There are three elements available for imitation: common practices, organizations, and practices based on outcome (Haunschild & Miner, 1997). Organizations faced with

uncertainty were found to either imitate common practices or large or successful

organizations (Haunschild & Miner, 1997). Critiques of the application of diffusion theory have addressed the positive normative bias associated with innovation (Downs & Mohr, 1976). This bias is related to the normative assumptions that change is positive or constant condition. The investigation of diffusion at the state level neglects the implementation of policies at the state and organizational level and the actual impact of the implementation. Implementation at the organizational level is essential for the adopted innovations and changing provider practices.

Innovation in Organizations

While the diffusion of innovative legislative concepts across states provides a context for understanding the diffusion of public policy, the adoption of evidence-based practices requires the application of practices at the organizational level. Organizations represent a central element in the implementation of innovative provider practices to individual providers. For the purposes of this review, organizations are associated with counties based on their role in purchasing practices from an array of providers.

Organizations inhabit a critical juncture between the outer and inner contextual fields where the innovation is implemented into patterns of practice (Greenhalgh, Macfarlane, Bate, & Kyriakidou, 2004, p.595). The outer context and inter-organizational network serve as sources of influence in the innovation process (Greenhalgh, 2004). In an investigation of the adoption and subsequent abandonment of matrix management in

hospitals, organizations with similar attributes exerted an impact on the decision of an organization to adopt a management program (Burns & Wholey, 1993). This result is similar to the regional effect and homophilic characteristics noted in the state policy and Roger's diffusion of innovation research (Sutherland, 1950; Light, 1978; Rogers, 2003). However, there are other elements that impact diffusion. One significant gap in the literature is the implementation of multiple innovations using numerous methodologies providing a robust interpretation of applicable processes.

Innovations have been shown to function differently by type and size of organization (Damanpour, 1991; Camisón-Zornoza, Lapiedra-Alcamí, Segarra-Ciprés, & Boronat-Navarro, 2004). The implementation process requires realignment of resources within the organization and as a result, some types of organizational structures are more highly correlated with a particular type of innovation (Damanpour, 1991). Studies have also illustrated some influential factors in organizational decision-making. A study of Canadian organizations, determined that decentralized decision-making, information-sharing programs, and organizations with incentive pay plans were more likely to innovate however the relationships were weak (Zoghi, Mohr, & Meyer, 2010). The complexity of the environment also impacts the diffusion of innovations.

Diffusion of Innovations in Complex Environments

There are special considerations for the implementation in complex environments. Diffusion of innovative practices in complex environments occurs through non-linear processes influenced by contextual factors including wider clinical practices (Denis, Hébert, Langley, Lozeau, & Trottier, 2002; Fitzgerald, Ferlie, Wood, & Hawkins, 2002). Given this complex environment, there is a concern regarding the sustainability of innovations to impact outcomes over time without diminishing (Martin, Currie, Finn, & McDonald, 2011). Implementing evidence-based practices represents a complex process in which success is determined through the involvement of a wide variety of stakeholders. An assortment of factors need to be considered in the planning process including the particular practice, and the social, organizational, economic, and political context surrounding the practice (Grol & Wensing, 2004). However, research focuses on individual practices avoiding broad based public policy. From a logistical standpoint, the idiosyncratic aspects of the evidence-based practices are difficult to address when multiple practices are implemented as a public policy with numerous components. In addition to these practice-related factors, individual practitioner and stakeholder issues increase the cost for successful implementation (Ploeg, Davies, Edwards, Gifford, & Miller, 2007). Potential barriers to adoption exist at multiple levels and include the patient, provider, group, organizational, and policy level (Ferlie & Shortell, 2001). Organizations are critical in the state implementation of evidence-based practices.

Organizational Implementation Context

Several factors facilitate the implementation of innovations in organizations. In a case study of long-term change of healthcare organizations, five factors were determined to facilitate change: system momentum to change, leadership commitment, staff engagement, resource allocation alignment, and integration of inter-organizational boundaries (Lukas, Holmes, Cohen, Restuccia, Cramer, Shwartz, & Charns, 2007). The type of organization has also been found to influence evidence-based practice implementation. For example, private organizations have been found to provide greater support and report positive attitudes to the adoption of evidence-based practices (Aarons, Sommerfeld, & Walrath-Greene, 2009). Organizational climate impacts the individual provider attitudes toward the adoption of evidence-based practices (Aarons & Sawitzky, 2006). Additionally, organizational culture has been found to influence the adoption of innovations in a national sample of mental health clinics (Glisson, Landsverk, Schoenwald, Kelleher, Hoagwood, Mayberg, & Green, 2008). In professional settings, inter-organizational relationships are influenced by a variety of intra-organizational and professional networks which have been shown collectively to alter provider treatment selection practices regardless of evidence (Blau & Scott, 1962; Scott, 2000; Campion & Gadd, 2009). Professions are unique based on the professional community which provides socialization and some aspects of internal ranking of members, that information is not available to the public (Goode, 1957).

While organizational networks impact innovation adoption decisions, provider networks influence individual adoption patterns (Frambach & Schillewaert, 2002). At

the individual practitioner level, research has shown that policies and procedures for the use of research informed practices are insufficient to change provider practices (Squires, Moralejo, & LeFort, 2007). Influences external to the organization have historically demonstrated influence on professional provider practices. For example, an investigation of the diffusion of a pharmaceutical intervention among physicians observed that adoption occurred initially through professional groups and subsequently through less formal relationships (Coleman, Katz, & Menzel, 1957). In a related study of the implementation of prescription pharmaceuticals, the slope of innovation adoption were found to be dependent on pharmaceutical type with the greatest commonality occurring among late adopters (Steffensen, Sørensen, & Olesen, 1999). In an environment with competing influences, there are contextual and temporal components influencing the implementation and sustaining of innovative practices. There have been attempts to unify these influential factors into a comprehensive conceptual model for evidence-based practices.

A multi-level conceptual model for the implementation of evidence-based practices in public service organizations integrates temporal and contextual elements (Aarons, Hurlburt, & Horwitz, 2011). Similar to Greenhalgh's (2004), this model represents inner and outer contextual components. The conceptual model includes four stages of implementation with inner and outer contextual elements (Aarons, Hulburt, & Horwitz, 2011). The outer and inner contextual factors change as the decision-making develops toward sustaining evidence-based practices. The outer context consists of sociopolitical and funding, client advocacy, and inter-organizational networks (Aarons, Hulburt, & Horwitz, 2011). Applying this model to a practical situation, Oregon's

legislative mandate occupies the outer contextual component first in the initiation of evidence-based practices and later as sustaining the effort to implement evidence-based practices. The inner context involves intra-organizational characteristics and individual adopter characteristics (Aarons, Hurlburt, & Horwitz, 2011). These conceptual models represent a potential implementation mechanism for evidence-based practices at the state level. In an effort to more fully interpret the implementation process, a growing literature has developed regarding implementation outcomes.

Implementation Outcomes

An emerging literature is developing with a focus on implementation process outcomes (Proctor, Silmere, Raghavan, Hovmand, Aarons, Bunger, & Griffey, et al., 2011). These outcomes serve as implementation process and intermediate outcomes indicators (Proctor, Silmere, Raghavan, Hovmand, Aarons, Bunger, & Griffey, et al., 2011). Implementation outcomes serve as a mechanism for validating the uptake of innovative practices by organizations and practitioners (Donaldson, Rutledge, & Ashley, 2004). Implementation is impeded by a limited understanding of the processes involved in implementation (Michie, Fixsen, Grimshaw, & Eccles, 2009). In addition, there are several levels of outcomes involved in implementation which can be categorized into three outcome types: implementation, service, and client (Proctor, Landsverk, Aarons, Chambers, Glisson, & Mittman, 2008). Implementation outcomes address the effectiveness of implementation effort, service outcomes address the program effort and client outcomes address individual level outcomes (Proctor, Landsverk, Aarons, Chambers, Glisson, & Mittman, 2008). Selections of implementation outcome measures

present an additional challenge. The implementation literature is categorized into six general implementation strategies: planning, education, financing, restructuring, managing quality, and policy contexts (Powell, McMillen, Proctor, Carpenter, Griffey, Bunker, & Glass, et al., 2011). Outcomes can be evaluated from multiple stakeholder perspectives. Although there is increasing need for monitoring policy effectiveness, a gap remains in the literature regarding the impact on evidence-based practice policy on client outcomes.

Diffusion of Innovations Conclusions

Rogers (2003) concept of the diffusion of innovation provides a foundation for examining the innovation of evidence-based practices in organizations. This framework can be applied to a variety of academic and professional fields and organizations. The application of the diffusion of innovation to comparative state policy reveals internal and regional acceptance influencing state decisions to adopt innovative practices. The diffusion of innovative public policies represents an innovation which consists of ideas that are malleable and can be adopted at varying rates across states. At the organizational level, organizations can be influenced at inner and outer contextual levels. Similar to state diffusion patterns, adoption occurs most often in similar organizations. Internal organizational culture and networks are important factors for diffusion between organizations. Implementation outcomes research focus on the success of the implementation effort. While the diffusion of innovation literature has identified categorical factors that impact implementation, the literature does not identify which factors influence a broad public policy on client outcomes. The institutionalism literature

provides a sufficient appraisal of the particular factors that impinge the selection of practices by behavioral health organizations.

Implications for the Study

The diffusion of innovation literature provides a basis for evaluating Oregon's evidence-based practice mandate and its ability to standardize practices across organizations. The diffusion of innovation literature also provides a framework for normative expectations of practice diffusion across organizations with several contextual factors such as individual and regional factors impacting implementation. One complication for the diffusion of evidence-based practices in Oregon is the substantial number of approved practices. While the diffusion of innovation literature provides guidance regarding the diffusion of particular practices across organizational units, the diffusion of an array of practices creates an exponentially more complex diffusion pattern. The normative evidence-based practice model assumes that organizational units will assess practices based on the level of evidence and impact on outcomes. However, within the array of approved evidence-based practices, it is assumed that organizations have sufficient information to discern the level of evidence for particular practices. Lacking sufficient information discriminating the level of evidence among approved practices, organizations will select practices using other determinants such as practices adopted by other organizations in the region or those that the organization frequently interacts.

The diffusion of innovation literature identifies variation in implementation of innovation by organizational type and size indicating that factors external to the

innovation impact the diffusion process (Damanpour, 1991; Camisón-Zornoza, Lapidra-Alcamí, Segarra-Ciprés, & Boronat-Navarro, 2004). Organizational and professional networks influence the diffusion of innovations which further demonstrates the impact of contextual factors on implementation (Frambach & Schillewaert, 2002; Coleman, Katz, & Menzel, 1957). Contextual factors of diffusion can be further refined through inner and outer organizational components (Isett, Burnam, Coleman-Beattie, Hyde, Morrissey, Magnabosco, & Rapp, et al., 2007; Aarons, Hulburt, & Horwitz, 2011). Oregon's legislative mandate emphasizes the outer level of context leaving decisions regarding the inner context to local jurisdictions. The inner context focuses on intra-organizational and individual adopter characteristics (Aarons, Hulburt & Horwitz, 2011). In the Oregon example, this is the level where the decision to implement a particular approved practice resides. While the selection of practices provides direction to the types of practices that can be selected based on the level of evidence, it gives little guidance as to which particular practices will be selected. Focusing policy on the determination of evidence avoids mechanisms in which the selection process occurs. This omission is significant because challenges to implementation reside at multiple levels including the patient, provider, group, organizational, and policy level (Ferlie & Shortell, 2001). The Oregon legislative mandate assumes impact on outcomes but there are several challenges at multiple levels that inhibit the implementation of practices. While it is assumed that counties will purchase practices that improve outcomes, there are significant barriers at multiple levels that influence the adoption of practices. Given these challenges, organizations may select practices on factors other than the level of evidence of a particular practice. The decision of practice selection occurs at the county level but

operates through service contracts with provider organizations. Counties contract with an array of service providers but the individual practice adoption decision occurs at the organizational level. In order to analyze the process of practice selection and the factors that impact the selection decision requires a review of the organizational literature specific to the institutional environment applicable to behavioral health. This review commences with the sociological institutional literature. In healthcare, organizations operate with considerable state and federal regulation enlisting additional responsibilities which are indicative of institutions rather than the more general organizational responsibilities. The organizational selection of evidence-based practices is best analyzed within the sociological institutionalism framework and in particular, neo-institutional theory.

Institutionalism

Institutions are a fundamental aspect of social interactions and have been the topic of investigation in several academic fields (March & Olsen, 1996; Meyer & Rowan, 2006; Scott, 2000). Scott (1995) defines institutions as entities that “consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior.” North (1993, p.62) distinguishes institutions as constraints imposed on human interactions which provide the boundaries organizations operate. North (1993, p. 64) postulates that institutional change occurs incrementally due to the related network characteristics that bias the costs toward the established system. Sociological institutionalism focuses on cultural norms and the ability of cultural norms to explain changes in organizations (Landman & Robinson, 2009).

Sociological Institutionalism

The sociological literature on institutionalism draws on the traditional work of Selznick (1966) and particularly on the investigation of the Tennessee Valley Authority (TVA). Selznick's (1966) case study focused on the internal mechanisms of the TVA and their impact on the organization. Selznick identified co-optation as the "process of absorbing new elements into the leadership or policy determining structure of an organization as a means of averting threats to its stability or existence" (Selznick, 1966, p.13). The institutional environment is impacted by the co-optation process resulting in changes in the structure and decisions of the organization (Selznick, 1966, p.13). Selznick focused on the co-optation of the organization by stakeholders meeting their individual needs (Selznick, 1966). This traditional view of institutions focused on the political environment within the organization. While organizations represent rational systems, they are formed by "forces tangential" to their structure and goals (Selznick, 1966, p.251). The rationality of the organization is impinged by individuals who represent more than their organizationally defined role. The organization is adaptable to the institutional environment. Further developments of sociological institutionalism in the form of Neo-institutionalism investigate the processes which the structure and processes of organizations change.

Institutions and Organizations

Selznick differentiates between an organization which represents a system of coordinated activities and an institution which is a 'responsive, adaptive organism' to the needs and pressures of society (Selznick, 1957, p.5). Institutions have a history which

develops through responding to internal and external pressures (Selznick, 1957, p.16).

This process of institutionalism involves the infusion of values beyond the technical requirements (Selznick, 1957, p.16-17). This process identifies the role of culture in changing organizational structure. This view is expanded in the Sociological Neo-Institutional literature.

Sociological Neo-Institutionalism

Neo-institutionalism developed from traditional institutionalism but differs in several distinct aspects (DiMaggio & Powell, 1991, p.12). Traditional and Neo-Institutionalism view the progression of an organization becoming an institution as limiting the options available to the organization and acknowledge the significant impact of culture (DiMaggio & Powell, 1991). However, there is a differentiation between traditional and neo-institutionalism. For example, traditional institutionalism attributed informal interactions within the organization as inhibiting the formal organizational structure whereas neo-institutionalism views the formal structure itself as a source of irrationality (DiMaggio & Powell, 1991, p.13). Drawing on the social psychology literature, Neo-institutionalism also attempts to identify the impact of the institution on the practices of individuals (Powell & Colyvas, 2008). In this respect, Neo-Institutionalism addresses cognitive aspects and operates at the societal level (Scott, 1995). There are some implications for healthcare organizations. Healthcare organizations represent institutions based on their high level of integration with the regulatory environment (Scott, 2000). This regulatory milieu creates a unique environment for healthcare. For example, institutional structures in the healthcare

environment have demonstrated a positive impact the sharing of knowledge across organizations (Kim, Newby-Bennetthiu, & Song, 2012).

One of the key insights of neo-institutional theory is the analysis of facilitative and inhibitory factors that operate in, within, and between organizations. DiMaggio & Powell (1983, p.147), assert that the forces that drive bureaucracies to become more homogenous are not competition or efficiency as postulated by Weber (1930/1992) but, rather forces that originate from the state and professions. Organizations become more homogenous through the process of isomorphism (DiMaggio & Powell, p.149).

Isomorphism refers to the constraining of a unit in a population to resemble other units in response to an external condition (DiMaggio & Powell, p. 149). The three responses to external conditions are coercive, mimetic, and normative (DiMaggio & Powell, p. 150). Coercive isomorphism refers to both formal and informal external pressures that compel organizational units to become more similar (DiMaggio & Powell, p.152). Through the use of coercive isomorphism, an organization would begin to use evidence-based practices due to the external pressures. Professional organizations also serve as a source of isomorphism (DiMaggio & Powell, p. 152). In the case of the State of Oregon's legislative mandate, the professions are not mandated to use evidence-based practices. The professions have the potential to become increasingly similar as the normative isomorphism serves to reorient the professions toward providing approved evidence-based practices. Mandating the purchase of evidence-based practices indirectly focuses on the processes while leaving the methods, training, and professional development to the professions. DiMaggio and Powell hypothesize that organizations with the most frequent state interactions will have a greater rate of isomorphism (DiMaggio & Powell, 1983,

p.155). Applied to the implementation of evidence-based practices, organizations with the most state interactions would be expected to conform to state requirements more rapidly compared to organizations with less frequent interactions. However, mimetic isomorphism can represent an efficient response to uncertainty (DiMaggio & Powell, 1983, p.151). Complex and fragmented organizational environments have been shown to increase administrative intensity (Meyer, Scott, & Strang, 1987). Increased complexity and ambiguity in goals, increases the likelihood that an organization will mimic a successful organization (DiMaggio & Powell, 1983). Governmental organizations have been found to be more susceptible to mimetic, normative, and coercive isomorphism than public sector organizations (Frumkin & Galaskiewicz, 2004). The complexity of organizations and impact of goal ambiguity may be overstated. Despite abstract organizational goals, goals can be inferred from practice (Selznick, 1996). Selznick (1996) also cautions against the over interpretation of the impact of postmodern influences based on their lack of attention to variation and context (Selznick, 1992).

The research has revealed some distinctions in the impact of isomorphism on organizations. When organizational isomorphism is distinguished between compliance and convergence, compliance is found to have a more significant impact (Ashworth, Boyne, & Delbridge, 2009). In addition, isomorphism was found to have a more significant impact on organizational strategies and culture rather than structure and processes (Ashworth, Boyne, & Delbridge, 2009). The implementation of standardized managerial mechanisms also impacts innovation. Performance management systems act as a mediator for the impact of management innovation on organizational performance (Walker, Damanpour, & Devece, 2011). When viewing non-technical innovations such as

management techniques, organizational memory and learning capabilities were found to increase the development of organizational and marketing innovation (Camisón & Villar-López, 2011).

One of the key insights of neo-institutional theory is the analysis of factors that facilitate and inhibit changes in within and between organizations. As noted above, the impetus for organizational change has adjusted from market competitiveness and efficiency to internal organizational structures developed through processes designed to meet the needs of the state and professions (DiMaggio & Powell, 1983). The state and professions serve as the rationalizing agents for organizations against uncertainty.

Rationalizing Elements

In addition to the State serving as a source of organizational rationalization, other entities exert a less integrated and more indirect influence such as various regulatory agencies, intergovernmental relations, stakeholders, and interest groups (Meyer, 1994). In behavioral health care, the impact is dispersed across governmental agencies. Professions also serve as a rationalizing element in organizations (Meyer, 1994). Influence occurs at several levels. Academic and professional societies impact the direction of professions, the administrative practitioner influences the allocation of resources, and the practitioner level maintains professional autonomy (Freidson, 1988). The medical profession is the most important element in determining the social structure of medicine (Freidson, 2006). This professional dominance impacts the interaction between professionals and organizations. At the individual level, a professional's engagement in a professional organization rationalizes the professional and limits the organizations ability to rationally

deploy the professional (Scott, 1966). There is the potential for conflict between the organization and the professional. Nevertheless, the relationship between professional and organization can vary and limit the potential for conflict through consultation or other contractual arrangements. The state exerts control over professionals through the regulation of the health professions.

Regulation of the healthcare professions

Regulation has historically assumed an important role in the provision of healthcare and a significant motivation for state regulation is the knowledge and power asymmetry that exists in interactions between clients and professionals (Jost, 1988; Leffler, 1978). Regulation and licensure provide the client a measure of assurance that a professional has comparable skill and knowledge equivalent to other members of the profession. One of the critical distinguishing factors of professions is their control over the quality and quantity of work (Freidson, 1973). Professions of expertise are able to gain monopoly status over their scope of work based on the considerable power of the professional association and state support (Freidson, 1988, p.22). In a related fashion, medical professions have expanded their clinical role over time. One contributing factor is the expansion of the disease concept resulting in the medical profession being able to address a variety of aspects of human behavior (Freidson, 2006, p.7). This is particularly relevant in the field of behavioral health where clinical diagnosis is based on the external manifestation of behavior and frequently includes social control. One factor that has lessened the professional dominance of the medical profession is managed care (Scott, 2000). There are several competing factors that influence the structure of healthcare

organizations. In addition to professional and managed care, agency has an impact on the structure of organizations.

Within the Neo-Institutionalism literature there is a debate regarding the influence of agency to structure in organizations (DiMaggio, 1988). The literature identifies individual institutional entrepreneurs and their role in the endogenous impact on institutions (DiMaggio, 1988). The impact of these individuals is nested in the organization (Battilana, 2006). The professions serve to exert influence on the organization and the influence of institutional effects. Professions create rationalizations through its membership. However, the role of professionalism in society has changed from community and authority to one of expert (Brint, 2006). The result is dynamic environment with several factors of varying impact influencing the healthcare organization. The technically complex environment represented in behavioral health with its reliance on individual case level management presents unique influences on organizational structure.

Neo-Institutionalism and Organizations

Structural impact differs between technically complex and institutionally elaborated environments (Meyer & Scott, 1983). Whereas organizations developing in technically complex environments adopt efficient coordinative structures, those developing in an institutionally elaborated environment buffer their technical activities from the environment (Meyer & Scott, 1983). Organizations, especially in the healthcare sector, contain both technical and institutional environments and while professions attempt to control processes, there is internal and external pressure to obtain successful

outcomes (Scott & Backman, 1990). Some discrepancy exists in the interpretation of the environment of the mental health clinic and may be the result of the relative nature of comparing organizational environments and the influence of managed care. For example, Alexander & Scott (1984) identify the pre-managed care mental health organization as a weak institutional and technical environment opposed to hospitals which have a strong institutional and technical environment. This assessment is related to the lack of strong demands for efficient production and lack of a unifying approach or belief system (Alexander & Scott, 1984). However, Scott (1998) identifies mental health clinics as having weak technical but stronger institutional controls linked to the increased legal and professional standards. Behavioral health organizations have the ability to express strong technical and institutional environments through the application of standardized practices. Evidence-based practices applied as process measures provide a means for establishing a unified approach and increase demands for efficient production. Process measures increase the technical controls of the organization and increase accountability to external purchasers. In this manner, process measures have the potential to internally influence organizations through process of institutionalization.

The process of institutionalization can be applied to elements of organizations. The spheres of activity, form, and evaluative criteria used in an organization can be influenced by institutional set of values and norms (Hinings & Greenwood, 1988). Institutionalization and the process of legitimating occur through networks and authoritative organizations (Zucker, 1983). In order to develop a significant change that impacts client outcomes, organizations facilitate changes in individual provider practices. This transfer requires the organization to adopt a process to change individual behavior.

The process of orienting organizational learning toward outcome management involves

learning processes resulting in a change in orientation from socialization to

externalization (Walburg, 2006). This process is important in transferring organizational

changes to individual practitioners and is required to increase sustainability in a complex

healthcare environment (Martin, Currie, Finn, & McDonald, 2011). Organizational

learning and other managerial techniques can facilitate the implementation of evidence-

based practices in organizations and organizational networks (French, 2011).

Organizational learning provides a mechanism for evaluating and developing assessments

adaptive to the needs of a particular clinical or administrative group (Gerrish, Ashworth,

Lacey, Bailey, Cooke, Kendall, & McNeilly, 2007).

Conclusion from Neo-Institutional theory

Institutions are entities that govern individual activity and provide boundaries that

organizations can operate. Given this broad definition, institutionalism transcends a

variety of academic fields. Sociological institutionalism focuses on the role of culture on

organizations. In sociological institutionalism theory, institutions are rational

organizations which can have its rationality impinged by individuals who represent more

than their organizational role. Sociological Neo-Institutionalism expands on this concept

and emphasizes that the rational structure of an organization itself can impinge on the

rationality of the organization. Organizations can imitate other organizations through

coercive, mimetic, or normative isomorphism. The application of these theories to

organizations guides the analysis of evidence-based practices. Complex and fragmented

organizational environments have been shown to increase administrative intensity.

Governmental organizations have been found to be more susceptible to isomorphism than private organizations (Aarons, Sommerfeld, & Walrath-Greene, 2009). The isomorphism literature notes that when isomorphism has a more significant impact in instances of compliance (Ashworth, Boyne, & Delbridge, 2009). Professions, regulatory agencies, intergovernmental relations, stakeholders, and interest groups operate as rationalizing elements in organizations (Meyer & Rowan, 1977). In particular, professions limit the ability of the organization to rationally direct the employer. Evidence-based practices provide an opportunity for developing a unifying approach that aligns professions and organizations toward internal and external measures. Behavioral health organizations are constrained by the types of services they are able to provide which increases the likelihood that organizations institutionalize. Behavioral health organizations are more likely to institutionalize towards the expectations of the state due to the frequent contact. The adaption of internal organizational structure and the external environment is a focus of contingency theory.

Implications for the Study

Institutionalism theory distinguishes institutions from organizations based on the constraints they place on social behavior (North, 1993). Institutional structure can inhibit behavior and be a source of irrationality (DiMaggio & Powell, 1991). There are sources of irrationality that influence organizational behavior that originate from the regulatory environment and internal to the organization. In Oregon, the legislative mandate provided an external stimulus to behavioral health organizations in which the response can be interpreted through the concept of isomorphism. DiMaggio & Powell (1983) identify

coercive, mimetic, and normative types of isomorphism. In order to gain an understanding of the implications, the evidence-based practice mandate will be viewed through each of these three types.

Coercive isomorphism results from pressures placed on an organization from structures such as the regulatory environment. In the legislative mandate, the state constrained county choice in interventions available for purchase. This constraint impacted the organizational structure established in order to provide approved practices. In the legislative mandate, coercive isomorphism is inhibited by two significant factors. First, a wide range of practices were recognized as evidence-based practices with significant variation between types of practice. Organizations are able to adopt practices that align with their individual organizational mission and not constrain to a defined subset of state mandated practices. A second factor is that the legislative mandate did not focus on particular populations. Counties could purchase practices based on any target population or combination of populations, therefore counties can maintain focus on their preferred population without constraining to meet mandate requirements. However, there are less direct forms of impact as a result of the legislative mandate. Monitoring and tracking evidence-based practices at the organizational level requires counties and organizations to establish the selection of practices. This act changes management practices and provides a rational framework for evaluating the interventions provided at the organizational and county levels.

Organizations also adapt practices based on uncertainty through mimetic processes. Mimetic isomorphic pressures manifest in organizations modeling successful organizations instead of making administrative decisions based on measure effectiveness.

In regards to Oregon's legislative mandate, mimetic isomorphism would be present if organizations or counties would select practices similar to organizations or counties deemed successful exclusive of the needs of the community.

The final isomorphic pressure is normative pressure which occurs through professionalization. Applied to Oregon's legislative mandate, a normative pressure would be present in organizations making practice selection decisions based on the professional orientation of the management or the providers. Organizations with a particular professional orientation would select practices that represent the profession rather than those practices that are necessary to meet the needs of the population. Normative pressure is indirectly addressed in the measurement of practices that require professionals to implement practices. Normative pressure would result in an elevated number of practices that require professionals to implement. However, in behavioral health there is not one dominate profession and there is a reliance on para-professionals to deliver services. This serves to dilute the expected impact of normative isomorphic forces on evidence-based practice implementation in behavioral health.

It is through the process of isomorphism that organizations standardize practices. In order to measure these potential isomorphic effects, transaction costs and administrative complexity are monitored. Isomorphism would represent the selection of process based on factors other than the transaction cost or administrative complexity. In effect, isomorphism represents organizational decision-making that does not follow a rational pattern. These isomorphic factors have the potential to significantly impact the selection of evidence-based practices. While this explains the impact of external pressures on an organization, it does not provide guidance regarding changes to the

organizational structure in response to these pressures. Contingency theory provides a theoretical approach that examines the relationship between organizational structure and the environment.

Contingency Theory

Contingency theory attempts to explain the interaction between internal organizational structure and the external environment. The theory attempts to determine the most effective organizational structure by the fit of several factors including the size of the organization, technology, and organizations environment (Lawrence & Lorsch, 1967). The optimal set of factors is unique to an organization and environment and no one correct method exists to design an organization (Galbraith, 1973). The concept of contingency is based on observations that the structure of an organization is contingent on the technology employed by the firm (Woodward, 1965). Technologies can be grouped into categories which are bounded by organizational rationality (Thompson, 1967). Organizational rationality is a factor of constraints, contingencies, and control variables (Thompson, 1967). Organizational structures can be categorized as mechanic or organic (Burns & Stalker, 1961/1994). Organizations that utilize organic structures are better able to quickly adapt to environmental changes are more effective in sectors undergoing significant change whereas mechanistic structures are more effective in established sectors (Burns & Stalker, 1961/1994). An individual operating in an organic system organizes tasks around the challenges of the firm instead of distinct formalized definition of roles, responsibilities and communication structure (Burns & Stalker, 1961/1994). The enhanced need for information in uncertain environments increase the importance of communication structures in these environments.

Information and uncertainty play an important role in the development of organizational structure. Environments with higher uncertainty require more information

resulting in the development of communication and control structures (Galbraith, 1973).

These communication structures are important to the organization and the role of the executive is central to developing a communication structure that assists in meeting the goals of its members (Barnard, 1968). Uncertainty has also been demonstrated to impact organizational development. Newer organizations are more likely to fail due to developing and documenting new roles, which creates inefficiencies, and less developed ties (Stinchcombe, 1965, p.148-149). In uncertain situations it is difficult for the organization to establish the proper fit with the external environment. Innovative situations create environments with relatively high levels of uncertainty. However the contingency model has been used to explain the increases in organizational performance from the adoption of information technology systems in health care (Devaraj & Kohli, 2000). The fit between internal organizational structure and external environment and changed over time is the focus of contemporary contingency theories. Traditional contingency theory provides an explanatory model for the interaction of the organization with the external environment but provides limited guidance regarding the development of distinct mechanisms for the process of change. The Structural Contingency Theory provides a framework for the process in which an organization adjusts to changes in the external environment.

Structural Contingency Theory

Structural contingency theory focuses on the adaptation of organizational structure in relationship to identified contingencies (Pfeffer, 1982). Environment, size, and organizational strategy are the identified contingency factors which impact

organizational effectiveness (Donaldson, 2001). Donaldson's (2001) Structural

Adaptation to Regain Fit Theory (SARFIT) has demonstrated that organizations with fit outperform those lacking fit and serves as a model of adaption involving the interaction of organizational structures and the environment. The model develops a continuum in which the organization adjusts to environmental changes (Donaldson, 2001). The temporal cycle of structural fit process is referred to as organizational fit followed by misfit, contingency change, structural adaption, and new fit (Donaldson, 2001). Fit refers to an organization positively influencing performance through the establishment of an organization structure corresponding to contingency variables (Donaldson, 2001).

Conversely, misfit indicates a mismatch between structure and contingency factors (Donaldson, 2001). Structural adaption occurs when organizational performance passes a negative threshold and as a result the organization changes structure to address the performance deficit (Donaldson, 2001). In this stage, the structure of the organization changes in order to maintain effectiveness in response to changes in the external environment. This structural change results in a new fit in which adaptation between organization and contingencies result in a change in an effort to restore performance (Donaldson, 2001). In an effort to obtain high performance, health organizations adapt to the contingencies of the external environment. Effectiveness is determined through the efficient transformation of inputs to outputs that fit with the external contingencies (Johnson, 2009). In the case of Oregon, the external regulatory environment was altered by the requirement for evidence-based practices. As the mandate increased the amount of required evidence-based practices over time, organizations would need to adapt their structure to meet the new regulatory expectations. Organizations modify their structure to

adapt to the requirements for evidence-based practice which as a result impact the convergence or standardization of evidence-based practices across organizations.

Oregon's legislative mandate did not provide additional funding or training for the implementation of evidence-based practices and therefore organizations adapted to the external environment based on organizational needs rather than standardized procedure.

In addition to structural changes to the external environment, there are environmental constraints in the form of governance structures which constrain the choices of organizations which are discussed in the review of New Institutional Economics and Transaction Cost Economics.

Conclusion from Contingency Theory

Contingency theory provides a framework for analyzing changes in internal organizational structure to the external environment. Contingency theory states that organizational structure is determined by the fit of the size of the organization, technology, and the organizations environment (Lawrence & Lorsch, 1967; Woodward, 1965; Burns & Stalker, 1961/1994). The main element of contingency theory is that there is no one best method to structure an organization. Contingency theory research provides some insight on the factors that impact organizational structure. Information and the level of uncertainty impact the organizational structure (Galbraith, 1973). The fit of the organization can have positive impact on performance whereas misfit leads to negative impacts on performance (Donaldson, 2001). The structure of the organization can go through stages of readapting to the external environment in which the organization regains fit with the external environment (Donaldson, 2001).

Implications for the Study

Contingency theory provides several insights that inform an analysis of the implementation of evidence-based practices in Oregon. The most important observation is the tenet that no one best structure exists for an organization. Instead, organizations modify their structure to adapt to the environment. The level of fit between the environment and the organization impacts effectiveness. Over time the structures of organizations are expected to adapt to the legislative mandate and the provision of evidence-based practices. The process is similar to isomorphic factors in that organizations adapt to the environment. This also indicates that through the process of altering the regulatory environment, the evidence-based practice mandate has the potential to change organizational structure. While the evidence-based practice mandate focuses on the process of providing services, there is the potential to impact organizational structure. This change in organizational structure possesses the ability to impact the standardization of evidence-based practices across counties. Monitoring the implementation of administratively complex practices has the potential of indirectly detecting structural changes through the adoption of practices. The effect would be delayed and present in a uniform increase of administratively complex practices as organizations restructured to meet the change in regulatory environment. However, the true effectiveness of counties would have to be measured through an accepted outcome measure. It would also be difficult to relate changes in structure to the practices selected for adoption. While contingency theory focuses on structural changes between the organization and the environment, new institutional economic theory and specifically

transaction cost economics analyzes the associated costs and the organizational decision to implement a particular evidence-based practice.

New Institutional Economic Theory

Organizations develop out of a need to coordinate and control tasks and transactions (Scott, 1998). One method of interpreting the interaction between organizations and individuals is as a market transaction operating through contracts (Perrow, 1986). This theoretical approach is presented in New Institutional Economics and provides a means of examining the third-party contractual environment present in behavioral health and the choice of an organization to adopt an evidence-based practice. Organizational economics also serves as a term to unify the theoretical elements of agency theory and transaction cost economics under an overarching theoretical framework (Barney & Ouchi, 1986). This review of literature will provide an overview of the economic view of behavioral health service delivery and focus on transaction cost economics. This theoretical approach provides insights on the relation between principal and agent and the issue of knowledge asymmetry and the market and organizational hierarchy respectively. In addition, transaction cost economics provides a basis for analyzing the costs associated with administrative complexity and its impact on the organizational selection of a particular evidence-based practice.

Measurement Cost

Measuring the cost and quality of behavioral health services is complicated but mental health services appear to share similarities with the general health system (Druss, 2006). The contractual structure of the firm allows for an exchange of knowledge and qualities regarding the use of various inputs and efficiently rewarding inputs (Alchian & Demsetz, 1972). However, there are potential errors in measuring the quality of a product which require additional controls (Barzel, 1983). There are specific qualifications for behavioral health services. Professional providers of medical and behavioral health services have a vested interest in presenting uniform quality for their representative profession (Brazel, 1983). For example, the American Medical Association puts forth a considerable effort attempting to persuade purchasers that individual medical professionals provide equivalent care (Brazel, 1983). However, a standardized credential gives little information on the quality of the individual clinical encounter beyond certain minimal requirements. The consumer and principal require additional information on the provider and the service provided to make an informed assessment of quality. However for publically funding behavioral health, there are multiple funding sources and the use of indigent and charity care which complicates the assessment of cost and quality of care. Regardless of these complications, the principal needs to measure the cost of the product in order to make an informed decision for purchase. In situations where signals of service quality are not evident or incentives are not present, the principal must look for information from other sources (Spence, 1973). Evidence-based practices provide information on the quality of services and serve as a proxy for price information. In

addition to challenges related to the measurement of cost, there are also variations in the information between the provider and other parties involved in the transaction.

Asymmetric information

One of the main challenges to the implementation of evidence-based practices at the state level is the lack of common information between the provider, the patient, and the payer in the health system. The economic literature addresses the imbalance of product knowledge between seller and buyer through the concept of asymmetric information. In Akerlof's (1970) discussion of the importance of trust in certain economic markets, he states that when buyers use a market statistic to evaluate quality, an incentive exists for sellers to provide low quality goods. The incentive exists due to the fact that any return on good quality accrues to the entire group rather than the individual seller, resulting in a reduction in the quality and the number of sellers of quality goods (Akerlof, p.488). The main reason for these deleterious effects is the presence of asymmetrical information in the transaction. The buyer has only one market level indicator from which to make a purchase however, there are numerous products of varying degrees of quality. The buyer makes the determination based on market level indicators without having information on individual level quality indicators. The result is that sellers of quality goods are forced out of the market. One method of reducing uncertainty on quality is the use of licensure that provides protections against substandard quality (Akerlof, p.500). However, when enforcing or encouraging clinical or managerial processes, licensure may not have sufficient scope. Licensure may ensure general competencies but does not provide

insurance regarding the provision of specific processes. In fact licensure ensures general competencies in an effort to not have to monitor individual processes. An additional consideration is that the client or provider may not know if any evidence-based practice is being provided and therefore limited method for recourse.

In the health care environment, information asymmetry can impact the relationship between buyers and sellers in ways that extend beyond the traditional relationship. The high level of uncertainty associated with delivering medical care is not amenable to market interventions (Arrow, 1963). The uncertain medical environment creates a premium for accurate information in which some consumers are better able to access than others (Arrow, 1963; Hass-Wilson, 2001). Situations with a high information cost for consumers allow firms to charge a higher price than the market rate which can give rise to monopoly power (Stiglitz, 1989). The methods available to firms to induce customers are advertising and reputation systems (Stiglitz, 1989). Imperfect information also impacts the quality and variety of goods provided at the time of purchase (Stiglitz, 1989). In addition to the long term potential negative consequences associated with reputation, firms can disclose information regarding product quality, certification through third party, guarantees, and prices are available mechanisms to express quality to the consumer.

In the public behavioral health market, the consumer does not purchase the service. The third party contractual relationship between the state mental health authority and the county or managed care organizations emphasize local relationships and reputation. The mechanism for consumer input is through a grievance process and not direct interaction between the consumer and the provider. The distance

between the purchaser and the consumer provides less incentive to maintain quality with the consumer rather than ensuring a valuable reputation with the purchaser. Given the nature of behavioral health service provision, a barrier exists for the consumer to evaluate the quality of treatment disentangled from other contextual elements.

As a result of knowledge asymmetry in healthcare transactions, the patient may not be able to differentiate that they are receiving an evidence-based versus non-evidence-based practice. This differs from market transactions where the buyer is able to make a judgment on quality. There is little information on the impact on regulatory activity on the quality of services (Frank, 1989). However, a proxy quality signal available to purchasers is the price of services (Haas-Wilson, 1990; Stiglitz, 1989). The misalignment of the principal-agent relation mechanism makes differentiation of quality by price an ineffective measure. The principal requires additional information external to the consumer of services in order to make informed decision on the quality of services received during the course of behavioral health treatment.

Contracts are incapable of a sufficient level of completeness or specificity to address all the potential rights and duties due to knowledge asymmetry (Arrow, 1974). One method of gaining information about an agent is through the relationship with the principal and previous transactions or by the choices made by the agent and self-selection or signaling (Rothschild & Stiglitz, 1976). Using this method, the principal is able to use information gathered regarding the process to determine the quality of product. The most important information available regarding the quality of services are the outcomes received from individuals receiving services. Evidence-

based practices provide quality information to the purchaser and the consumer.

Lacking quality information, evidence-based practices fulfill the role of a quality indicator. The cost for individually contracting with professionals for each task must be weighed with the cost associated with internalizing the professional into the organization. Coase (1937) notes that contracts obtained directly from the market have imbedded costs which can be mitigated by internalizing some of the contracted functions into the organization. This cost can be reduced by integrating the contracted items into organizational production. Viewed from the standpoint of evidence-based practices, a provider can either contract for a clinician to provide a particular evidence-based practice or integrate the practice into the organization. The organization can also hire individual practitioners that have a particular evidence-based practice skill set instead of contracting out for particular services. The resulting decision ultimately impacts health outcomes. The contractual relationship between the principal and agent relates with the external environment including stakeholder response resulting in an impact on system performance (Liu, Hotchkiss, & Bose, 2007). When viewed at the provider network level, several variables impact effectiveness. In a comparative study of four community mental health systems, integration of the network, amount of external control, stability of the system, and abundance of environmental resources were found to impact the effectiveness of the network (Proven & Milward, 1995).

Organizations of different types can perform similarly in certain environments. Non-profit organizations can perform similarly to for-profit when they compete in similar environments (Weisbrod, 1998). Specific to mental health networks,

performance for for-profit and non-profit managed organizations were found to be similar (Milward, Provan, Fish, Isett, & Huang, 2009). One possible contributing factor for this similarity can be attributed to the fact that while the management differed, contracted providers were non-profits (Milward, Provan, Fish, Isett, & Huang, 2009). While the type of organization appears to have a limited impact on performance, the underlying decision to implement a particular practice can vary by the decisions internally to the organization. Transaction cost economics provides the tools for analyzing the mechanisms driving this decision.

Transaction Cost Economics

Traditional institutional economics integrates neo-classical economic theory with the analysis of institutional constraints and how they change over time (North, 1986). In contrast, New Institutional Economic theory focuses on the constraints placed by institutions and expands beyond the neo-classical definition of utility functions (North, 1986). In addition to the sociological analysis of institutions and their determinants, they are also analyzed through economic theory (Matthews, 1986). One particularly informative theoretical representation of New Institutional Economic theory is Transaction Cost Economics (TCE). Transaction Cost Economics (TCE) focuses on the transaction which Williamson (1985) defines as an act that “occurs when a good or service is transferred across technologically separable interface.” Each transaction incurs a cost to obtain information regarding the transaction. Transaction costs serve as the unit of analysis for the study of organizations and arise from limited information, uncertainty about future actions, and opportunistic actions (Williamson, 1985; Williamson, 1981).

There are additional informational constraints. Bounded rationality refers to the inability of individuals to process all available information and relates to consequences resulting from decisions based on imperfect information (Simon, 1957). This limits the ability of an individual or organization to plan and address all possible situations (Macher & Richman, 2008).

In addition to the cognitive barrier to transaction decisions, Williamson (1985) identifies three variables: frequency, uncertainty and asset specificity that distinguish any transaction. One central decision point for any transaction is the decision to pay a market rate for the service or vertically integrate the service into the organization. An organization is not likely to vertically integrate an infrequently occurring transaction. Uncertainty arises due to the inability of an organization to predict future events, the greater the length of the transaction, the higher the uncertainty (Williamson, 1985). Likewise, due to bounded rationality, the agency experiences uncertainty based on the lack of information regarding all the possible consequences of the transaction. Asset specificity refers to the degree to which the asset is valuable only to the context of the transaction (Williamson, 1985). Applied to behavioral health situations, asset specificity refers to program resources or staff specifically applicable to a certain task. If the agency has a limited return on the investment in a particular evidence-based practice or the principal has limited means for monitoring the process, the agency can redeploy resources for greater profit or maximize efficiency (McGuinness, 1994). However, if there is high asset specificity, it is difficult to re-deploy staff. The specificity of assets and ease of measurement are identified as transaction costs with the potential to influence contracting (Brown & Potoski, 2005). Practices or programs that have additional

administrative complexity are more difficult to orientate to less complex practices and therefore are more challenging for an organization to measure. One additional decision specific to Oregon's implementation is that the organization can choose to adopt a less administratively complex evidence-based practice thus differing transaction costs. Transaction costs can be viewed more broadly than the discrete transaction event. Transaction costs can be incurred between actors before and after the transaction event (Williamson, 1985). Given the robustness of the event, transaction costs are difficult to measure and can relate to the transaction process in addition to market externalities (Goldberg, 1989).

When there is a high level of asset specificity such as a practice that requires highly qualified professional staff, institutions can adapt the governance structure to vertically integrate transactions (Williamson, 1985). Working relationships that require specific type of labor and therefore represent a higher level of asset specificity provide an environment with the need for a governance structure that sufficiently meets the needs of organization and employee (Williamson, 1986). Institutions provide stability through structure and reducing uncertainty through the use of formal rules, informal constraints and enforcement mechanisms (North, 1990). In addition to providing internal stability, organizations invest resources to acquire information for their interactions with the external environment. Transaction costs are the price of information required to measure and enforce the market exchange for the services (North, 1990). Transactions are not necessarily efficient due to institutions applying various rules and regulations that can raise or lower costs (North, 1990). Efficient institutions are developed through incentives provided to individuals with the bargaining strength to incrementally change (North,

1990). Transaction costs develop in order to reduce uncertainty for informal constraints and measurement for contract enforcement (North, p.37).

Governing Structure

Transaction costs consist of issues of governance and measurement whereas incentives relate to agency and property rights (Williamson, 1985). The political governance structure defines and enforces the guidelines for the incentive structure (North, 1998). Viewed broadly, contracts are influenced by bounded rationality resulting in contracts lacking complete information (Williamson, 2002). In addition, the structure depends on the mode of governance (Williamson, 2002). Behavioral standards also impact structure resulting in the most significant level of interaction occurring between individuals in contact with the organization, and an elevated importance for cooperative adaption (Williamson, 2002). The decision to vertically integrate a specific practice occurs through a consideration of transaction costs which has demonstrated application in state-level managed care networks (Robinson & Casalino, 1996). Several factors in healthcare impact the organizational decision to vertically integrate a transaction: a significant number of available vendors, desired adaptability, a normative market-oriented commitment to contracting for services, structural features, and performance (Scott, 2000). Processes are more amenable to vertical integration when the cost of providing the process is less than contracting out for the process. From the state perspective, evidence-based practices are more amenable to vertical integration when the cost of providing evidence-based practices is less than contracting for evidence-based

practices. Cost can include a variety of factors and resource dependency and political factors increase costs and can provide disincentives for vertical integration.

Organizations make the decision to vertically integrate practices based on motivations other than efficiency. Governance models can be developed to mitigate provider opportunism in the contracts for services. An example of opportunism in evidence-based practices would be organizations presenting as applying a particular evidence-based practice when the practice is not in fact being applied. There are four sources of controls against opportunism in the principal-professional interaction: self, community, bureaucratic, and client (Sharma, 1997). When applied to behavioral health care, there are multiple layers of bureaucratic control relating to the intergovernmental relationships and blending of funding sources. Even with the presence of controls there are challenges. Sharma (1997) argues that rational controls can be over applied and cause the professional agents to find areas of opportunism that are more difficult to detect. In order to reduce opportunism, the state needs additional information regarding purchased services. The state is able to gain information regarding process quality by identifying and tracking outcomes through contract. Process measures like evidence-based practices which rely on previous research to determine the quality of an intervention, can be applied with outcome measures to provide a measure for determining the applicability of the process to the current population.

Organizations attempt to develop their governance structure to reduce transaction costs (Scott, 2000). There are varying types of costs to contracting out for services to providing services internally. An organization can contract out for service and incur a cost or provide the service internally which requires resource costs such as capital

expenditures, training and related costs (Scott, 2000). Resource costs are greater for services that are not aligned with the current resources of the organization (Scott, 2000). Assuming that evidence-based practices are innovative practices not currently employed by organizations, high resource costs could lead to organizations selecting practices that exhibit lower resource costs. Without information regarding individual level outcomes, the state is unable to make informed decisions regarding the current level of quality and the effectiveness of treatments.

Transaction Cost Economics Conclusion

Transaction Cost Economics provides an analysis of organizational decisions to implement a particular evidence-based practice. Transaction Costs distinguish limitations in the form of knowledge asymmetry and bounded rationality. Organizations use transaction costs to determine whether to vertically integrate a particular evidence-based practice. Transaction costs are established through the frequency, associated uncertainty, and the asset specificity related to the transaction (Williamson, 1985). Applied to behavioral health, organizations chose to adopt evidence-based practices on these factors rather than purely on the demonstrated evidence of the practice. Transaction Cost Economics is particularly functional in analyzing how an organization evaluates costs related to the decision to integrate new practices. Organizations have several evidence-based practices to choose, transaction costs allow for the analysis of the organizational decision to vertically integration a practice. Transaction costs develop the discussion regarding organization choice beyond the normative assumption that organizations will adopt the practices with the most established evidence to other factors that have the

potential to impact the decision. This provides a mechanism for analyzing the array of factors that influence the decision-making process. In particular, it provides information on the potential mechanism for the selection of administratively complex practices compared to less resource intensive practices. This allows the analysis to advance from normative explanations for the lack of adoption of evidence-based practices to a more descriptive discussion of the role of evidence-based practices in the organizational context.

Implications for the Study

Transaction cost economics provide the means of determining the organizational decision to vertically integrate a particular evidence-based practice. The three most important aspects in this decision are: the frequency of the transaction, the uncertainty associated with the transaction, and the asset specificity related to the transaction (Williamson, 1985). The evidence-based practice mandate orients counties to dedicate a percentage of state funds toward the purchase of evidence-based practices but does not indicate the selection or distribution of practices. Organizations are able to make the decision to vertically integrate a particular practice required at a sufficient frequency to necessitate integration. An evidence-based practice infrequently required in a particular clinical population is less likely to be included in the practices offered by an organization. Similarly, in areas with uncertainty regarding the potential impact of a practice, there is a decreased likelihood for implementation. Practices with less uncertainty have been reviewed by multiple evaluative or national databases. Asset specificity addresses the ability to apply resources beyond a particular practice. High asset specificity refers to

materials applied specifically to the intervention and is unavailable to other innovations.

These practices are represented in the measurement of administrative complexity.

Practices that are administratively complex have a higher rate of asset specificity related to the administration of the practice. Organizations that make decisions solely on the level of evidence would ignore the administrative complexity of a particular practice.

While transaction cost economics informs the selection of practices by organizations, the most important measure of the influence of evidence-based policies is the impact on county outcomes.

Evidence-based Practice Impact on Outcomes

The Institute of Medicine defines quality as " the extent to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Institute of Medicine 1990). Based on this definition of quality, evidence based practices are integral to providing quality behavioral health services based on their critical role in providing practitioners with current professional knowledge that is validated through research. There are three categories of challenges to quality; overuse, underuse, and misuse (Chasin, 1991). Of those three categories, evidence-based practices address the underuse of effective practices by promoting research based practices. Possible causes for underuse are related to the volume of information and the interventions available to the practitioner (Chasin, 1991). Evidence-based practices identify and standardize best practices for providers. In addition, the standardization of practices has the potential to improve quality and outcomes. Health quality and outcomes are best understood through a structure-process-

outcome model and Donabedian's Health Quality theory (1966) provides a framework for analyzing quality in the health care system.

Donabedian's Health Quality Model

One of the challenges in health outcomes research is specifically attributing change in patient condition to medical interventions. Donabedian (1980, p.82-83) defines health outcomes as "a change in a patient's current and future health status and future health status that can be attributed to antecedent health care." Using this definition of health outcome, outcome is defined as directly related to the health care intervention. Outcomes at the health system level are attributed to program interventions. Donabedian (1966) developed the Health Quality model to determine the effectiveness and quality in healthcare. The Health Quality Model provides an overview of the influences on health outcomes and is separated into structure, process, and outcome components. The structure component refers to the physical settings, human resources, and characteristics of the organization including financing required to provide health services (Donabedian, 1966). Process refers to activities that contribute to the diagnosis and treatment of patients (Donabedian, 1966). Outcome refers to changes in the health status, behavior, and satisfaction of patients (Donabedian, 1966). Each section of the model influences the probability on the adjacent component and determines the relationship between components. Donabedian (1988) further describes that quality develops outward from

the practitioner to the community and stresses that optimal care is attained only when monetary considerations are carefully considered by both the practitioner and the fully informed patient (Donabedian, 1988, p.1744-1745). However, as stated previously, healthcare interactions occur in an environment with knowledge asymmetry and the client unable to determine the quality of provided services. An additional difficulty is the influence of third-party payers (Donabedian, 1988, p.1745). Despite these challenges, Donabedian's (1966; 1980) model provides a useful theoretical template for analyzing the impact of evidence-base practices on health outcomes.

Service Provision and Process Measures

Evidence-based practices represent a process measure for quality of care (Rubin, Pronovost, & Diette, 2001). While process measures do not serve as outcome processes, they provide baseline criteria for provider services which can impact outcomes (Rubin, Pronovost, & Diette, 2001; Mainz, 2003). These processes provide a baseline level of assurance regarding the quality of practices. The use of process measures to assess medical quality has an established history. Lembcke (1956) first developed methods for establishing criteria for the evaluation of medical practice which, along with investigations into the quality of health services, influenced investigations into mental health process (Donabedian, 1966; Zusman, 1969). Process measures represent intermediate measures in relation to outcome measures. Process measures have the potential to be sensitive to the quality of care because providers can directly control the measures (Feldman, 2003). In order to work, process measures need to have some

demonstrated efficacy (Feldman, 2003). Evidence-based practices deliver a means of determining the efficacy of process measures.

There are challenges that are associated with standardizing behavioral health services. Behavioral health services involve the provision of services to chronic conditions that enter the health system through various entry-points and are difficult to track through the disease career (Pescosolido, 1999). The transitory nature of outcomes that accompany chronic psychiatric conditions is a factor of the ability to determine the effectiveness of population and group interventions. In addition, behavioral healthcare occurs in an environment with a high level of individual and social network influence impacting treatment (Lin & Peek, 1999; Turner, 1999). The high level of individual variability has the potential to develop perceived inefficiencies in the current system. Considerable individual client level and complex contextual factors impact treatment and impede efforts to standardize treatment. However at the clinical management level, variations in individual acuity and contextual factors can be addressed through assessment of illness severity, acuity, case and care complexity and related case-mix adjustment (Lyons, Howard, O'Mahoney, & Lish, 1997). Standardization occurs at the clinical management level but, the actual practices are left to the theoretical predisposition of the provider. Standardization of behavioral health services requires integrating several professions and Para-professions organized around clinical practices and treatments. Given that there is not a singular profession to standardized practices; the theoretical training of the individual and professional affiliation has the potential to influence treatment selection.

Clinical Outcome Measures

Clinical outcomes in behavioral health are defined as characteristics of the consumer that can be reasonably expected to change as a result of intervention (Lyons, Howard, O'Mahoney, & Lish, 1997, p.27). As a result of this definition, efforts to address clinical outcomes are directed to the consumer, the need to measure over the course of treatment, and directly attributable changes to the behavioral health intervention (Lyons, Howard, O'Mahoney, & Lish, 1997, p.27). This type of outcome relevant data is critically needed for decision-makers (Speer & Newman, 1996). The need for outcome data is specific to the behavioral health fields and transcends country-level differences. For example, a review of mental health policy evaluation across Europe, found a need for methodological development for outcome measurement and evaluation of complex interventions that occur outside the health system (Evers, Salvador-Carulla, Halsteinli, & McDaid, 2007). Outcome measures serve as accountability measures for public funding and determining effectiveness and quality improvement (Speer, 1998, p. 115).

One challenge to tracking outcomes in behavioral health is that individuals may have multiple treatment episodes over the course of the illness (Pescosolido & Boyer, 1999). Outcomes related to treatment episode may provide an intermediate outcome rather than a discrete treatment outcome. This highlights the need for accurate tracking of treatment quality in an attempt to lower long range costs that extend through the course of a chronic illness. An additional consideration is the influence of social factors in the determination of illness. Several social factors that influence the utilization of health services: personal habits, age, socioeconomic status, poverty, sex, race, and

environment (Saddock & Kaplan, 1998). In mental health, frequently used patient outcome measures are patient functioning, symptoms, recovery, quality of life, service use, and satisfaction with care (Hendryx, 2004, p.431). One method of isolating the confounding factors and distinguishing the true effect of treatment is through risk adjustment (Iezzoni, 1997). Risk adjustment involves the accounts for variables that effect the measurement of the dependent variable (Hendryx, 2004). Iezzoni (1997) identifies three dimensions for mental health risk: Need, Predisposing, and Enabling. Need corresponds with diagnosis, severity, clinical stability, co-morbidities, physical functioning (Iezzoni, 1997). Predisposing factors correspond to demographics, cultural and ethnic factors, preferences and attitudes, and quality of life (Iezzoni, 1997). Enabling factors are associated with: insurance coverage, community poverty, and distance to treatment, socioeconomic status, and social functioning (Iezzoni, 1997). Challenges include identifying risk attributes to lack of awareness to risk variables that effect treatment and inability to collect data on risk attributes. (Hendryx,2004, p.432).

Review of Donabedian's Health Quality Model

Donabedian's (1966) health quality model provides a framework for analyzing quality in the healthcare system. There are several influential factors with the potential to impact outcomes. The supply of behavioral health providers influences the structure of services however; the variety of provider types encumbers standardization efforts. The structure of state behavioral health care has become increasingly decentralized. Evidence-based practices represent process measures address the quality of health care services. One of the challenges to measuring the quality of behavioral health services is that

behavioral health conditions tend to be chronic and therefore require several treatment episodes. Another challenge is the impact of contextual factors such as social networks on behavioral health treatment. The utilization of services and the associated behavioral health outcomes are impacted by numerous contextual factors. Further research is needed on the impact of contextual factors on behavioral health processes and outcomes.

Implications for the Study

Donabedian's Health Quality model illustrates the influence of context and its impact on determining outcomes. Monitoring the evidence-based practice processes is not directly related to outcomes and therefore provides a limited view of impact. Donabedian's Health Quality model illustrates that processes provide one component of the evaluation of service quality. This is extremely important because the intent of evidence-based practices is to improve the quality of services. Focusing on processes provides useful information regarding the practices used in clinical environments but, does not provide information on the quality of services received. Given the significant effort to establish evidence-based practices, process changes are insufficient without a link to improved quality. In an effort to establish a methodology to examine outcomes, the impact on inpatient hospitalization is monitored. While there is no uniform agreement on the appropriate outcome for measurement, monitoring an outcome represents a significant development in assessing the impact of evidence-based practices as a public

policy. Instead of indirectly measuring the impact of evidence-based practices through processes, the direct impact on outcomes provides a means of measuring the impact of evidence-based practices as policy and provides information on the contextual influences on the selection of practices by organizations. The focus on outcomes provides a means of interpreting evidence-based practices as a public policy within the broader context of organizations and the contextual environment that they operate.

Conclusion

This review focused on literature addressing the implementation of evidence-based practices and its potential impact on outcomes and standardization of practices. This review covered the literature addressing the applied literature on the implementation of evidence-based practices which identified normative and contextual models for the analysis of evidence. While normative models focus on the evaluation of evidence, contextual models analyze the impact of contextual factors on evidence. Several critiques of evidence-based policy and practices are directed to a strict interpretation of the normative model that does not incorporate contextual factors. Evaluating the application of numerous evidence-based practices at the state-level requires a contextual analysis of the implementation of practices. However, the application of evidence-based practices as a legislative mandate relies solely on the normative model. In addition, a significant gap in research surrounds the implementation of an array of evidence-based practices and the standardization of practices across multiple organizations. In an effort to understand

theoretical factors that influence the implementation of evidence-based practices, the

research addressing the interaction of organizations and the environment were reviewed.

Evidence-based practices occur in complex environments that require an examination of contextual factors that impact outcomes and standardize practices across organizations. In the diffusion of innovative practices, internal and external context and organizational culture impact the implementation of evidence-based practices. For practices and state policies, innovations are based on regional behaviors. Implementation has shown to vary based on the characteristics of an individual practice and practitioner factors such as perception of the complexity of an evidence-based practice and professional affiliation. In addition, there are factors related to the patient that introduce complexity into the behavioral health environment. This relates to a complex implementation environment that does not appear to support distinct factors that guide the implementation of evidence-based practices or policy.

Organizations can adopt evidence-based practices through three isomorphic processes. These processes are rationalized through professions and governance. Of particular concern is that organizations appear to change practices when in fact they have not. The legislative mandate provides the governance mechanism which creates the impetus for organizations to adopt practices. This facilitates the apparent adoption of evidence-based practices. However, organizations may appear to provide evidence-based practices when they do not or select practices that are not the most effective or meet the needs of the community. Organizations may also alter their structure to articulate with the external environment. The individual organizational decision to vertically integrate a set of evidence-based practices is made with limited information through an analysis of

transaction costs based on the frequency, uncertainty, and asset specificity. Transaction cost economics examine the decision to adopt evidence-based practice within the broader context of organizational operations and provide a mechanism for understanding the vertical integration of practices across organizations. Structure, process, and outcome must be analyzed in order to provide an accurate assessment of evidence-based practices. The ability of evidence-based practices to standardize interventions across organizations and impact outcomes represents a test of the effectiveness of the evidence-based practice policy model.

Chapter Three: Methods

Despite legislative mandates for the purchase of evidence-based practices, there is limited research on the resulting impact on outcomes and provider practices (McCarthy, McConnell, Schmidt, 2009; Department of Humans Services, 2000; Leff , Mulkern, Lieberman, & Raab, 1994; Lehman & Steinwachs, 1998; Drake, Torrey, & McHugo, 2003). In order to address this gap in research literature, this study establishes a methodology utilizing evaluative and existing databases to determine the impact of the implementation of evidence-based practices on outcomes and selection of practices. This research addresses critical gaps in the literature on evidence-base practices as public policy and informs policy makers and future researchers regarding the implementation of behavioral health process measures on provider practices and the resulting impact on outcomes. This effort tests the rational framework of evidence-based practices in terms of practical public policy. Two particular aspects of the implementation are the focus of this study, the impact on county inpatient hospitalizations and the standardization of evidence-based practices across counties. Each of these areas provides critical evidence on the actual process and impact of applying evidence-based practice policy in a public behavioral health system.

Several potential outcomes are explored in this study related to inpatient hospitalizations and standardization of practices. Outcomes of this analysis carry implications that will guide further research and future policy. There are several potential results that influence policy and practices. For example, in the event that evidence-based practices are not associated with decreased inpatient hospitalization, then the impact of the adoption of evidence-based practices on this specific outcome domain may be less

direct than expressed in Oregon's legislative mandate. In the event that counties select disparate types of evidence-based practices, Oregon's mandate may exert a limited influence on county selection of practices. The results of this analysis assist efforts to examine the impact of evidence-based practice policy and guide further research in state implementation of evidence-based practice policy. In an effort to meet the needs of policy makers and future analysis, this research exhibits exploratory and confirmatory aspects which addresses practical and theoretical gaps in the literature specific to the state implementation of a wide array of evidence-based practices across jurisdictions.

Oregon's evidence-based practice mandate operated through an incremental implementation process that required the Addictions and Mental Health (AMH) Division to dedicate at least 25% of state funds to evidence-based practices in 2005, 50 % in 2008, and 75% in 2010 (Oregon Revised Statute, 182.525). Despite this goal, limited resources and legislative direction was provided to agencies or counties. Legislative implementation goals were set for the specific state agencies, the implementation rate and the type of adopted practices varied by county. This provides the basis for analyzing the implementation over time across counties. In addition, the significant discretion in practice selection allows for an analysis of the factors that influence the implementation of evidence-based practices. In order to distinguish the impact of county implemented practices, the adult or child target population and mental health or substance abuse treatment modality are categorized separately.

While the specific intent of the legislation is to reduce the need for emergency services, the Addiction and Mental Health (AMH) agency interpreted this intent broadly and established a process for evaluating all practice's regardless of the relation to

emergency services (State of Oregon Addictions and Mental Health Division, 2007). As a result, counties had discretion to purchase practices not directly related to psychiatric emergencies in addition to those directly related to those specific conditions. In total, practice selection was not immediately proscribed and therefore counties were able to individually interpret the relationship between practices and psychiatric emergencies. This lack of standardization allows for an examination of the implementation of evidence-based practices with limited state direction and therefore a reflection of county implementation factors. This provides the opportunity to evaluate the variety of county implementation responses and the impact on outcomes. The methods of analysis are responsive to the progressive implementation of the policy.

This study has implications for the assessment of the theoretical implications that extend beyond practical policy evaluation. Altogether, the focus of this research is to analyze the underlying assumptions imbedded in the rational evidence-based practice policy framework, develop a methodological basis for the evaluation of the impact of evidence-based practice policy, and identify factors that influence implementation. In order to obtain a more complete understanding of the impact of the evidence-based practice public policy, this proposed research will develop measures and establish a methodological base for investigating factors that influence evidence-based practice implementation. In an effort to determine the practical implications of evidence-based practice as policy, this research will determine the impact on inpatient hospital outcomes

Problem and Purposes Overview

Limited research is available directly addressing the impact of state evidence-based practice policy on organizational practices and population outcomes (McCarthy, McConnell, & Schmidt, 2009). The purpose of this study is to investigate the impact of state-level evidence-based practice implementation. Evidence-based practice policy represents a policy intervention with the intended impact of standardizing practices and improving outcomes. However, there are challenges that have the potential to impinge implementation across organizations and limit the impact on outcomes. This study addresses several potential factors that impact evidence-based practices policy. The results can extend the research by addressing several critical aspects. In particular, evidence-based practices policy may not impact the number of individuals receiving inpatient hospital treatment for behavioral health disorders or generally accepted practices may not converge or standardize across counties. Contextual factors might influence the organizational decision to implement evidence-based practices. Practices requiring additional transaction costs represented by administratively complex practices such as practices that require professionals to implement or practices requiring multiple providers to administer may influence the decision to adopt a practice. The result of this analysis is an increased level of understanding regarding factors unrelated to the level of evidence that impact implementation and outcomes.

Research Questions and Hypotheses

In order to assess the impact of the implementation of evidence-based practices on outcomes and convergence across counties, the following research questions and hypotheses are analyzed. The unit of analysis for the first research question is county year whereas the second research question applies a practice by year unit of analysis.

Research Question 1: How did implementation of Evidence-Based Practices in Oregon change or standardize over time, in total and by subgroup?

Hypothesis 1: In total and across subgroups, the average number of Evidence-Based Practices implemented per county will increase over time

Hypothesis 2: In total and across subgroups, at least 50% of Evidence-Based Practices will be adopted by at least a majority of the counties

Research Question 2: How did county resource levels influence the implementation of Evidence-Based Practices in Oregon?

Hypothesis 1: The average number of evidence-based practices implemented per county will not vary with county resource levels.

Hypothesis 2: The proportion of implemented evidence-based practices identified as more administratively complex will not vary by county resource levels.

Research Question 3: How did evidence-based practice implementation in Oregon relate to county per capita inpatient behavioral health discharges?

Hypothesis 1: In total, and by age and condition groups, average county per capita behavioral inpatient hospitalizations will decrease after the implementation of Oregon's Evidence-Based Practices policy

Hypothesis 2: In total, and by age and condition groups, average county per capita behavioral inpatient hospitalizations will decrease, after the implementation of Oregon's Evidence-Based Practices policy, at a faster rate in counties that implement a greater number of evidence based practices.

Research Design

The research design is a pre-post design utilizing the first year as the baseline year and subsequent years as post-implementation observations. Comparisons evaluate time-series data incorporating a difference-in-difference approach in which changes over years and among counties and practice attributes are analyzed. The effects of the policy will be evident by the relative effect in counties with specific implementation or other characteristics overtime. Virtually all of the hypotheses will be measured through regression analysis. The impact on inpatient hospitalization by county and year serves as the outcome measure for this study and is defined as by year and by year and county. Models have been developed for all county effects and to capture group effects. The

proportion of adopted evidence-based practices by group serves as the standardization of practices by county measure.

Sample

The research population consists of a total population of 34 of the 36 Oregon counties that report to the Oregon Health Authority (OHA) Addictions and Mental Health (AMH) agency. The county unit of analysis was selected from survey data provided by OHA. All 34 counties that completed the survey were included in the population. The counties of Gilliam and Wheeler did not complete the survey and were not included in the study population. The survey was conducted in 2005, 2008, and 2010. The outcome population consists of individuals with Oregon residency discharged from an in-patient hospital Oregon facility for the years 2003, 2007, and 2011.

Data

Several sources of data were collected for the purposes of analyzing the impact and county standardization of practices. Practice characteristic data was collected from several external databases. The protocol for practice information extraction is provided in Appendix A, and was developed and used to collect information for a variety of evaluative databases predominately from the National Registry of Evidence-based Programs and Practices (NREPP). However, in instances where there was uncertainty regarding the observed practice and the evaluated evidence-base, original guidance provided by the Addictions and Mental Health (AMH) agency which directed the use of other databases present at the time of agency evaluation. These databases included

Evidence Based Practices for Substance Abuse, the University of Nevada-Reno Center

for the Application of Substance Abuse Technologies (CASAT) and the University of Colorado Blueprint for Non-violent Programs. In the few events that this information proved unavailable, additional review was conducted. The Addictions and Mental Health (AMH) division provided the three waves of county evidence-based practices implementation surveys for the years 2005, 2008, and 2010. Data used from this source is restricted to those practices that remain present for all the survey years.

County Surveys

In order to meet legislative reporting requirements associated with the mandate, the Addictions and Mental Health (AMH) division administered three surveys in 2005, 2008, and 2010 that relied on county self-report of purchased evidence-based practices. The purpose of these surveys was to determine the percent of state funding directed toward evidence-based practices. Each year represents a progressive time point in the implementation of evidence-based practices. The surveys were collected from two sources. The 2005 and 2010 surveys were collected from requests from AMH staff and the 2008 survey was collected from information available on the AMH website. The surveys were then harmonized into one database representing all years.

In order to analyze the standardization of practices across counties, process measures were developed from administrative data collected in three waves (2005, 2008, and 2010). State implementation data was linked with nationally available national clearinghouse data providing practice characteristics for potential implementing organizations. County implementation measures were developed by categorizing

information obtained from the evaluative practice characteristic database and calculating implemented practices by group. The means of practices implemented were then compared for each category. Means reflect the presence or absence of an instance of an implemented practice and not the relative attested practices implemented by a county. For example, a county stating implementation of one practice will have an equivalent implementation rate as an alternate county listing 150 implemented practices. However, these rates would have a dissimilar implementation rate than a county lacking any attestation for a particular practice.

Clients Served and Resources

Data for the number of adult and children served were obtained for the AMH. Resources by county were obtained from an independent survey conducted in 2008 that calculated the total public funding for mental health by county (Public Consulting Group, 2008). This single time point relative assessment of county funding is applied across years.

Specific to the database tracking the number of clients served, the population of county administrative reporting units is reduced to 32. This reflects the integration of Hood River, Sherman, and Wasco counties into a single administrative unit (Mid-Columbia). In instances where this metric is used, counties will be aggregated to the Mid-Columbia administrative unit.

Evaluative Databases

Evaluative databases provide an authoritative source for the characteristics of particular evidence-based practices and allow for the comparison of practices based on these characteristics. Information for the reviewed practices cited on the Addictions and Mental Health (AMH) web-site were collected from publically available evaluative websites. Due to improvements in the collection of evaluative information, and the subsequent restriction to just those 53 practices that were present in all three survey instruments, the Federal Substance Abuse and Mental Health Services Administration's (SAMHSA) National Registry of Evidence-based Programs and Practices (NREPP) was the sole instrument retrieved in the final assessment. The protocol for obtaining information from these databases is in Appendix A.

In order to evaluate the information available to decision makers, evidence-based practices selected through Oregon's legislative mandate are analyzed through several types of evaluative databases identified in the administrative process. Two databases in particular; Evidence Based Practices for Substance Abuse maintained by the University of Washington and the University of Nevada Reno Center for the Application of Substance Abuse Technologies (CASAT), were used by Oregon's Addiction and Mental Health (AMH) to provide additional information for providers in their selection of evidence-based practices. For a small number of evidence-based programs, the University of Colorado Blueprint for Non-violent Programs was used to substantiate programs. Information was collected from these evaluative websites through the use of the protocol identified earlier and available in Appendix A. The information included characteristic information regarding the population addressed by the practice, requirements for

professional administration, and requirements for multiple providers or the implementation of a program.

While these databases assisted in early analyses, the Substance Abuse and Mental Health Services Administration's (SAMHSA) National Registry of Evidence-based Programs and Practices (NREPP), which was developed after AMH's evaluation of evidence-based practices was used to characterize a majority of those 53 practices monitored over the course of implementation observation. The NREPP is an online registry which replicates AMH's effort to develop a system in which providers submit practices for consideration. This system operates through an open invitation period in which mental health and substance abuse interventions can be submitted resulting in a subsequent review and rating by independent reviewers. The NREPP is not inclusive of all evidence-based practices identified by Oregon and represents only those sent to SAMHSA for review. However, while these practices do not represent a comprehensive list, they do represent practices that have been developed with the intent of national distribution. The information contained in the NREPP is extensive and provides a rich view of programs. The NREPP was not used by AMH in the selection of evidence-based practices but serves as confirmation of the practices selected in Oregon's process. Figure 3-1 is a table of the representation of Oregon evaluated practices in available evaluative databases.

Figure 3-1: Number of Practices Reviewed by Evaluative Database

Evaluative Database	Number of Practices
Total Number of practices reviewed by Oregon's AMH present in all three survey's	53
Practices also evaluated were reviewed by the National Registry of Evidence-based Programs and Practices (NREPP)*	32
Practices were reviewed by another source	21

Nationally Established Behavioral Health Practices

In addition to these evaluative databases, there are six practices that have been determined to be the core evidence-based practices for mental health (Drake, Goldman, Leff, Lehman, Dixon, Mueser, & Torrey, 2001). These six practices have been implemented widely and SAMHSA provided supplemental information that assist in implementation (Drake, Goldman, Leff, Lehman, Dixon, Mueser, & Torrey, 2001). Five of these practices: Assertive community treatment, Family psycho-education, Supported employment, Illness management and recovery skills, and integrated dual disorders treatment have been implemented in Oregon.

Oregon State Inpatient Discharge Database

Oregon Inpatient data for the years 2003, 2007, and 2011 were obtained from the Health Cost and Utilization Project (HCUP) database administered by the federal Agency for Health Research and Quality (AHRQ). In order to access this administrative dataset for the purposes of this project, the following determinations were used to identify mental health and substance abuse treatment. A representation of the fields available in the Oregon State Inpatient Discharge database is available in Appendix B. Oregon Hospital Discharge data was merged with the survey data and aggregated by county zip code.

Natural limitations regarding any diagnostic categorization including the International Statistical Classification of Diseases and Related Health Problems (ICD) introduce potential sources of measurement error. This limitation is methodologically acknowledged through a reduction of diagnostic information resulting in an isolation of primary diagnosis as an indicator of discharge status. Isolating primary diagnosis provides a method for capturing mental health and substance abuse inpatient discharges as well as providing a systematic method for identifying individuals with primary mental health or substance abuse diagnoses limiting secondary comorbidity. The Clinical Classifications Software (CCS) for ICD-10 was accessed to translate ICD diagnoses for use with the HCUP State Inpatient discharge dataset (Elixhauser, Steiner, & Palmer, 2013).

Measures

Outcome, process, and control measures were developed to evaluate the impact of the legislative mandate on inpatient discharge and county implementation of evidence-based practices. Per capita inpatient discharges by county serve as the outcome measure and are differentiated by age and mental health or substance abuse diagnosis. This measure identifies the impact of the evidence-based practice mandate on per capita inpatient hospital discharges by county. There are two process measures addressing the standardization of practices. The broad convergence measure focuses on the implementation of practices that have a higher expressed recognition through evaluative databases across counties. The goal of this measure is to determine the county adoption of practices with the highest level of professional credibility. The second process

measure addresses the transaction costs associated with evidence-based practice implementation by establishing the administrative complexity expressed through practices requiring professionals, multiple providers, or practices that represent a program. These measures were created through a review of the literature and an evaluation of available data. A diagram of the measure development process is provided in Appendix C. This measure addresses the associated costs related to the implementation of a particular practice. Measures of interest were created by categorizing counties by resources and number served. Figure 3-2 is a table with information on the measures developed for this study.

Figure 3-2: Description of Study Measures and Source Database

Measure	Description	Operational Definition	Data Source
Outcome Measure: Inpatient Discharges by County	Inpatient discharges categorized by county for child, adult, mental health, and substance abuse diagnosis (Related Diagnostic codes 290.00-316.99) Diagnostic Related Groups 425 19, 426 19, 427 19, 428 19, 430 19, 431 19 , 432 19, 433 20 , 521 20, 522 20, 523 20	Number of discharges per county Adult Mental Health Children's Mental Health Adult Substance Abuse Children's Substance Abuse Number of EBP's per county identified to treat population	Oregon Inpatient Discharge Database, County survey
Process Measure: Evidence-based Practice Implementation	Broad convergence of practices across counties measured by the implementation of established practices recognized by any of the following a) one of the six practice's that have been nationally implemented and supported, b) reviewed by a combination of regional databases or c) included in SAMSHA's national registry database d) practices not reviewed by a national database	Percent practices reviewed by evaluative database implemented by county Percent of Nationally Established Behavioral Health practices implemented by county	Evaluative databases, Nationally Established Behavioral Health Practices

	but accepted by the profession (example Cognitive Behavioral Therapy)		
Process Measure: Evidence-based Practice Implementation	Transaction costs of practices across counties measuring administrative complexity. Administrative complexity is measured by the implementation of practices that reference the need for a professional for implementation and practices that designate the need for multiple providers or indicate that the practice is a program.	Administratively complex practices Professional practice indicated for implementation Multiple providers or indicate practice is a program	Evaluative databases
Measure of Interest: County Resources	Resources based on the total FY 2008 public funding by county	2008 total funding for Mental Health by county	AMH Database
Measure of Interest: Number served by County	Total adults and children served by county (2005, 2008, 2010)	Number served (Children & Adult)	AMH Database
Measure of Interest: Urban/Rural County Designation	Urban and Rural designation by zip code	Urban and Rural designation by zip code	OHSU Rural Health designations

Indices

In order to provide sufficient sensitivity for the analysis, several indices have been developed. These indices were created to guide analysis and provide context to analysis and obtained results. The indices represent an exploratory classification of practices.

The indices categorize counties and practices into several classifications. These classifications assist in differentiating the impact based on a gradient. A categorical index is developed to reflect the relative levels of county implementation of evidence-based

practices, level of county resources, level of administrative complexity, and level of evidence. The proposed classifications are presented in Figures 3-3 to 3-7.

Figure 3-3: Categorical index of county implementation

Level of Implementation	Definition
High implementation	County has a sum number of the total number of practices implemented that is greater than the median number of practices implemented by county.
Low implementation	County has a sum number of the total number of practices implemented that is less than or equal to the median number of practices implemented by county.

Figure 3-4: Categorical Index of county resources

Level of Resources	Definition
High Resources	County has a calculated 2008 total mental health expenses above median county spending
Low Resources	County has a calculated 2008 total mental health expenses less than or equal to median county spending

Figure 3-5: Categorical Index of administrative complex practice

Level of Administrative Complexity	Definition
High Administrative Complexity	Practice meets the following conditions: indicates multiple providers are required and an indication that practice is a program
Medium Administrative Complexity	Practice meets the following condition: indication that multiple providers are required without a programmatic component
Low Administrative Complexity	Practice meets only the following condition: indication that an individual provider is required for implementation.

Figure 3-6: Categorical Index of level of evidence

Level of Evidence for approved evidence-based practice	Definition
High level of evidence	Nationally Established Behavioral Health Practices
Medium level of evidence	Practice reviewed by the National Registry of Evidence-Based Practices or Programs (NREPP) or another national evidence-based practice evaluative database
Low level of evidence-based practices	Practices that are not captured in a national evaluative database

Figure 3-7: In-patient Practices Categorical Index

Groups	Practices
Adult Mental Health Practices	Acceptance and Commitment Therapy Applied Suicide Intervention Skills Training (ASIST) American Society of Addiction Medicine Patient Placement (ASAM) Assertive Community Treatment (ACT) CBT - Cognitive Behavioral Therapy Consumer Run Drop-in Centers Co-Occurring Disorders: Integrated Dual Diagnosis Disorders DBT - Dialectic Behavioral Therapy Drug Court, Treatment Court, MH Court, Family Courts Eye Movement Desensitization and Preprocess (EMDR) Family Psych-education Illness Management and Recovery Improving Mood Promoting Access to Collaborative Treatment (IMPACT) Incredible Years Medication Management Non-violent Crisis Intervention Training Program Parent Management Training Parent-Child Interaction Therapy Seeking Safety Solution Focused Brief Therapy (SFBT) Strengthening Families Program (SFP) Strengths Model of Case Management

	Supported Education Supported Employment Supported Housing UCLA Social and Independent Living Skills Modules
Children's Mental Health Practices	Applied Suicide Intervention Skills Training (ASIST) ASAM - American Society of Addiction Medicine Patient Placement Behavioral Therapy for Adolescents Brief Strategic Family Therapy (BSFT) CBT - Cognitive Behavioral Therapy Collaborative Problem Solvers Early Assessment & Support Team (EAST) Family Psycho-education Functional Family Therapy (FFT) Illness Management and Recovery Incredible Years Medication Management Multidimensional Family Therapy (MFT) Multi-systemic Family Therapy Non-violent Crisis Intervention Training Program Parent Management Training Parent-Child Interaction Therapy Parenting Wisely Safe Dates Second Step Seeking Safety Strengthening Families Program (SFP) Wraparound
Adult Substance Abuse Practices	12 Step Facilitation ASAM - American Society of Addiction Medicine Patient Placement Assertive Community Treatment (ACT) Buprenorphine Community Reinforcement Approach (CRA) with Vouchers Co-Occurring Disorders: Integrated Dual Diagnosis Disorders DBT - Dialectic Behavioral Therapy Drug Court, Treatment Court, MH Court, Family Courts Helping Women Recover/Beyond Trauma Individual Drug Counseling Matrix Model

	Moral Recognition Therapy (MRT) Motivational Enhancement Therapy (MET) Motivational Interviewing (MI) Parent Management Training Pathways to Change Positive Action Relapse Prevention Therapy Seeking Safety Solution Focused Brief Therapy (SFBT) Strengthening Families Program (SFP) UCLA Social and Independent Living Skills Modules
Children's Substance Abuse Practices	American Society of Addiction Medicine Patient Placement (ASAM) Brief Strategic Family Therapy (BSFT) Cannabis Youth Treatment (CYT) Community Reinforcement Approach - Applied to Young Adult Substance Abusers Functional Family Therapy (FFT) Individual Drug Counseling Life Skills Moral Recognition Therapy (MRT) Multidimensional Family Therapy (MFT) Multidimensional Treatment Foster Care Multi-systemic Family Therapy Parent Management Training Parenting Wisely Positive Action Second Step Seeking Safety Strengthening Families Program (SFP)

Statistical Analysis

Two statistical models are applied to the analysis. The first model captures the all-county average effects for inpatient overall and treatment type. This model is used to distinguish average change in outcome across counties over time. The second model captures county group comparisons. This model is used to assess differential response to policy over time among groups of counties with different characteristics.

Model 1:

$$O_{it} = \alpha_0 + \beta_{1t}Y_t + \varepsilon_{it}$$

O_{it} = Outcome measure

Y_t = Dummy variable for post-implementation year t

α_0 = average county outcome level at baseline

β_1 = coefficient of change in outcome from baseline to Y_t time point (if statistically significant, indicates Y_t year is associated with a change in inpatient outcomes from baseline)

β_2 = coefficient of change in outcome from baseline to Y_t time point (if statistically significant, indicates Y_t year is associated with a change in inpatient outcomes from baseline)

Model 2:

$$O_{it} = \alpha_0 + \beta_1H_{it} + \beta_2Y_t + \beta_{12}Y_tH_{it} + \varepsilon_{it}$$

Varies by county (i)

Varies by time (t)

O_{it} = Outcome measure

H_{it} = Dichotomous measure of indicating a group of counties with specific implementation or implementation related characteristics (i.e. high and low resource levels).

Y_t = Dummy variable for post-implementation year t

α_0 = intercept term which reflects the average level of outcome at baseline for “excluded” county group related to measurement H_{it}

β_1 = baseline difference between excluded county group and county group(s) measured

by H_{it} (e.g. initial difference between low and high resource counties)

β_2 = change in outcome from baseline to year Y_t for “excluded” county group

β_{12} = difference-in-difference estimate – the difference outcomes from baseline to Y_t year

for the “excluded” county group deducted from the change in county groups measured

by H_{it} (if statistically significant, indicates the implementation effect for counties

measured by H_{it} are different from those not measured by H_{it})

County comparisons, such as resource level, are based on groups of counties categorized into high, medium, and low resources and are defined in the above indices section.

As noted in the hypothesis and method of measure section, General Linear Model (GLM) is used for inpatient outcomes in addition to a log link and assessment of appropriate error distribution (Manning & Mullahy, 2001). This method provides estimates of the relative rate of change in per capita inpatient hospitalizations over time. Models that address the number of practices adopted are analyzed through Ordinary Least Squares (OLS) regression. The proportion of evidence-based practices accepted is analyzed by logistic regression. All regression equations will apply the Huber/White sandwich estimator for standard errors to account for repeated measures (Huber, 1967; White, 1980). The Huber/White sandwich estimator for standard errors also provides a general adjustment for heteroscedasticity.

Hypothesis and Method of Measure

The method of measurement as it relates to each hypothesis is provided in Figure 3-12. Three general types of methods are used: General Linear Model (GLM) regression analysis, Logistic regression, and a direct count of implemented practices. As stated above, the unit of analysis for the first research question is county year whereas the second research question applies a practice by year unit of analysis.

Summary

This study uses aspects of a pre-post and difference –in- difference designs to determine the impact on outcomes of evidence-based practices on organizational selection of practices and inpatient behavioral health hospitalization. Inpatient hospitalizations are accessed for 2000-2010. In order to analyze the standardization of practices across organizations, measures were developed from a review of evaluative databases and three waves of state evidence-based practice implementation survey data. The evaluative databases facilitate the categorization of practices based on administrative complexity and other factors which result in a comparison of means for county practice adoption.

In order to analyze county impact on outcomes, a difference-in-difference model is estimated. The difference-in-difference model estimates the difference in outcomes for counties that have extensive implementation of a particular type of practice (child, adult, mental health or substance abuse related) compared with those counties with limited implementation by practice type thus creating a control group.

There are several limitations to this study related to the data, outcome model, and interpretation of select results. The focus of this study is on determining the presence of an impact on outcomes and similarities in adoption of practices across counties in order to guide further research and inform policy. The results of this study increase the knowledge of the impact of evidence-based practices as policy on outcomes and the ability to standardize practices across organizations.

Chapter Four: Results

This chapter focuses on results only with interpretation offered in the ensuing chapter. Results are presented as they relate to the research question. In order to provide consistency, results are provided in a uniform manner despite the fact that results presented in an individual table may not directly correlate with a relevant hypothesis. The first three tables present the mean number of evidence-based practices reported as implemented by county overall and grouped into theoretically informed categories. Collectively, the tables demonstrate the scope of implementation of evidence-based practices across thirty-four counties surveyed over three time points. These tables inform the first research question which asks how implementation of evidence-based practices standardizes over time, in total and by subgroup. Practice survey data includes all but two Oregon counties which for administrative reasons were not included in the survey. Fifty-three individual practices are categorized into treatment and age groups based on evaluation criteria. As a result of this grouping, the quantity of representative practices varies by group with some practices represented equally across dichotomous groups. While the quantities of practices constituting each category may vary by group, there are a total of 34 counties that can potentially implement each practice.

In order to capture the difference across groups and time, two separate statistical tests were employed. Subgroup variation was measured using the independent samples t-test comparing subgroup means for each survey year. Variation within subgroup over time was tested utilizing the Linear Probability Model, which assessed subgroup means over time.

Table 4.1A indicates total evidence-based practices increased over time reaching a peak average of slightly less than twenty- two practices implemented per county in the final survey year. This table demonstrates that mean total overall and grouped practices increased over time in line with the gradual mandate of the policy. Rates of overall practice increase and within each of the main sub-groups related to age and service type were very similar. This suggests fairly even implementation of EBP across these domains.

As mentioned above, there was overlap in practice for age and treatment sub-groupings. Groupings were determined using the National Registry of Evidence Based Practices and Programs (NREPP) assessed outcome categories and treatment appropriate age groups. The greatest percent change (76%) over the entire length of the survey was noted for those practices demonstrating combined adult and child clinical evidence. The percent increase for practices demonstrating an established evidence-base for adults and children was over 40 % higher than the percent change demonstrated in overall individual age groups over the entire survey time frame.

Group & Number of Practices in Group	2005 Mean (SE) county average practices Percent	2008 Mean (SE) county average practices Percent	2010 Mean (SE) county average practices Percent	2005-2008 Mean (SE) Difference Penetration Rate		2005-2010 Mean (SE) Difference Penetration Rate	
					sig		sig
Total (53)	7.18 (1.24) 14%	14.18(1.68) 27%	21.79 (1.39) 41%	7.00(2.09) 97%	**	14.61(1.87) 203%	**
Adult (38)	5.38 (.90) 14%	11.29(1.26) 30%	17.5(.97) 46%	5.91(1.56) 91%	**	12.12(1.32) 32%	**
Child (30)	3.68(.70) 12%	7.5(.97) 25%	11.09(.84) 37%	3.82(1.20) 104%	**	7.41(1.10) 201%	**
Supporting Adult & Child (15)	1.88(.37) 13%	4.62(.54) 31%	6.79(.38) 45%	2.74(.65) 146%	**	4.91(.53) 261%	**
Mental Health (37)	4.29(.77) 12%	10.94(1.32) 30%	15.03(1.04) 41%	6.65(1.53) 155%	**	10.74(1.30) 250%	**
Substance Abuse (34)	5.24(.88) 15%	8.88(1.07) 26%	13.35(.87) 39%	3.64(1.38) 11%	*	8.11(1.24) 155%	**
Supporting Mental Health & Substance	2.35(.41) 13%	5.65(.66) 31%	6.60(.489) 37%	3.30(.78) 140%		4.25(.64) 181%	**
*p<=.05							
**p<=.01							

Table 4.1 B: Average Number of Practices Implemented per County by Level of Establishment

Level of Establishment & Number of Practices	2005		2008		2010 Mean		2005-2008 Mean Difference Penetration	2005-2010 Mean Difference Penetration
	Mean (SE)	sig ^a	Mean (SE)	sig ^a	Mean (SE)	sig ^b	Rate	Rate
High (6)	1.32 (.26) 22%		2.5 (.30) 42%		4 (.28) 67%		1.17 (.40) 89%	2.7 (.38) 205%
Medium (32)	4.74 (.82) 15%	**	9.26 (1.1) 29%	**	13.74 (.85) 43%	**	4.53 (1.38) 96%	9.0 (1.18) 190%
Low (15)	1.17 (2.8) 8%		2.41 (.38) 16%		4.06 (.43) 27%		1.29 (.47) 115%	2.94 (.51) 57%

*p<=.05

**p<=.01

Sig^a significance determined with t-test comparison of group meansSig^b significance determined with Linear Probability Model comparison over time

Table 4.1 B presents the mean number of practices implemented per county by level of establishment. High, medium and low categories reflect the level of evidence supporting the practices. Levels of establishment are mutually exclusive categories. Implementation of practices at all three levels of establishment increased over time, and at fairly uniform rates. In terms of number of practices implemented, the group which established the greatest amount of professional recognition as a reputable was the largest at an average of just over one (1.06) practices implemented per county by 2010. The most significant increase over time was noted for medium established practices observed across all time points.

Table 4.1 C: Average Number of Practices Implemented per County by Level of Administrative Complexity

Level of Administrative Complexity	2005 Mean (SE) Percent	sig ^a	2008 Mean (SE) Percent	sig ^a	2010 Mean (SE) Percent	sig ^b	2005-2008 Mean Difference Penetration Rate	sig ^b	2005-2010 Mean Difference Penetration Rate	sig ^b
High 15 Practices	2.38 (.40) 16%		4.59 (.58) 31%		7.29 (.52) 49%		2.21 (.70) 93%	*	4.91 (.66) 206%	**
Medium 12 Practices	.82 (.20) 7%		2.91 (.38) 24%		2.44 (.31) 20%		2.09 (.43) 255%	**	1.62 (.37) 198%	*
Low 26 Practices	3.97 (.69) 15%	*	6.68 (.84) 26%		12.06 (.70) 46%	**	2.71 (1.09) 68%	**	8.09 (.98) 204%	**

*p<=.05

**p<=.01

Sig a significance determined with t-test comparison of group means

Sig b significance determined with Linear Probability Model comparison over time

Table 4.1 C presents the average number of practices implemented for each county by level of administrative complexity. Medium administratively complex practices were implemented at a significantly lower rate than practices determined to meet the criteria for high or low administratively complex practices. All groups significantly increased over time. Medium administratively complex practices stood the lone practice group not indicating an absolute increase in practices implemented for each time period, with the year 2008 indicating the peak implementation average.

Levels of administrative complexity are measured through roughly categorizing practice information based on the amount of resources indicated through evaluation databases required for implementation. The highest level of complexity is reserved for those practices which clearly demonstrate that multiple providers are required and

indication that the practice represents a program rather than a stand-alone individually administered practice. Medium complexity is indicative of multiple providers required for implementation lacking any indication that the practice represents a program necessitating the use of additional organizational resources. Low administrative complexity is defined as those practices that evaluative databases indicate require only an individual provider to implement the program with no other implementation requirements. In order to develop this metric, product information was accessed from the National Registry of Evidence-Based Programs and Practices. Results suggest practice selection preferences were bifurcated between practices demonstrating a need for multiple providers and additional program components and practices demonstrating only the need for an individual practitioner. Practices demonstrating medium levels of administrative complexity were implemented at significantly lower rates compared to high and low levels of administrative complexity.

Table 4.2 illustrates, in total and by sub-group, the distribution of practices adopted in a majority of counties. These results address the second hypothesis of the first research question suggesting at least half of the evidence-based practices adopted by at least a majority of the counties. While the results illustrate that the number of practices implemented in a majority of counties increased over time, the hypothesis that the policy leads to convergence of practice selection through each practice being implemented in at least 50% of counties is not met in general. Overall, only 22 or 42% of total practices were implemented in at least 50% of counties by 2010. Only one sub-group met the hypothesis. The six practices representing the highest level of evidence were each implemented in at least 50% of the counties by 2010. Relative rates of practice

implementation convergence generally followed patterns of practice adoption noted

above. Practice convergence decreased from high to low evidence practices, was greater for high and low complexity services compared to medium, and for combined child/adult services. Higher convergence rates were also seen in (overall) adult services.

Table 4.2: Number of Practices Implemented in a Majority of Counties

Practice Group	Number of Practices Implemented in a Majority* of Counties		
	2008		2005
All Practices (53)	1	8	22
Practice Ratio ^a	2%	15%	42%
Child (30)	0	4	11
Practices Ratio	0	13%	37%
Adult (38)	1	7	19
Practice Ratio	3%	18%	50%
Overlapping Adult & Child (15)	0	3	8
Practice Ratio	0%	20%	53%
Mental Health (36)	1	7	15
Practice Ratio	3%	19%	42%
Substance Abuse (32)	1	6	13
Practice Ratio	3%	19%	41%
Overlapping Mental Health and Substance Abuse (18)	1	5	6
Practice Ratio	6%	28%	33%
Administrative Complexity			
High (15)	1	2	8
Practice Ratio	7%	13%	53%
Medium (12)	0	2	3
Practice Ratio	0%	17%	25%
Low (26)	0	4	11
Practice Ratio	0%	15%	42%
Level of Evidence			
High (6)	1	2	6
Practice Ratio	17%	33%	100%
Medium (32)	0	6	12
Practice Ratio	0%	19%	38%
Low(15)	0	0	4
Practice Ratio	0%	0%	27%

Table 4.3 provides the results comparing overall practice implementation rates for high and low resource counties. These results are associated with the first hypothesis of the second research question that the number of practices implemented would not vary by county resource level. Reported practice implementation varied significantly by county level of resources. The number of practices implemented in high resource counties was significantly greater in high resource counties. This hypothesis was rejected.

Table 4.3: Differences in Practices Implemented by County Level of Resources

County Level of Resources	Practices Implemented	2005 Mean (SE)	2008 Mean (SE)	2010 Mean (SE)	2005-2008 Mean Difference	2005-2010 Mean Difference
		sig ^a	sig ^a	sig ^a	sig ^b	sig ^b
High	Mean	3.70	6.75	9.00	3.06 **	5.30 **
18 Counties	SE	0.46	0.60	0.84		
Low	Mean	0.91	2.36	4.62	1.45 **	3.72 **
16 Counties	SE	0.17	0.33	0.64		
High - Low	Difference	2.79 **	4.40 **	4.38 **	-1.60 **	-1.58
	SE	0.49	0.69	1.05	0.64	0.93

Sig^a significance determined using two-sample t-test with unequal variances and is reported in the High - Low value only

Sig^b significance determined using two-sample t-test with unequal variances over time

*p<=.05

**p<=.01

Table 4.4 examines overall practice implementation by county resource level spanning the spectrum of administratively complex practices. These results address the

second hypothesis of the second research question. As stated, the hypothesis supposes the number of practices implemented does not vary by level of administrative complexity.

The number of practices implemented varies significantly by county resource level and therefore, the hypothesis is rejected. Results indicate that high resource counties implement significantly more practices regardless of the level of administrative complexity.

Table 4.4: Differences in Practices Implemented by Administrative Complexity and County Resource Level

Administrative Complexity	Level of County Resources	Practices Implemented	2005 sig ^a	2008 sig ^a	2010 sig ^a	2005-2008 sig ^b	2005-2010 sig ^b
High 15 Practices	High	Mean	4.00	7.2	9.67	3.20 *	5.67 **
		SE	0.87	1.10	1.45		
	Low	Mean	1.20	2.42	5.13	1.22	3.93 **
		SE	0.38	0.67	1.12		
	High-Low	Difference	3.35 **	4.78 ***	4.53 *	1.98	1.73
Medium 12 Practices	High	Mean	2.00	7.25	6.50	5.25 **	4.5 **
		SE	0.58	1.43	1.47		
	Low	Mean	0.42	2.17	2.50	1.75 *	2.08
		SE	0.23	0.76	0.97		
	High-Low	Difference	1.58 *	5.08 **	4.00 *	3.50	2.42
Low 26 Practices	High	Mean	4.31	6.27	9.77	1.96	5.46 **
		SE	0.71	0.85	1.32		
	Low	Mean	0.96	2.4	5.31	1.44 **	4.35 **
		SE	0.25	0.67	1.12		
	High-Low	Difference	3.35 **	3.87 **	4.46 **	0.52	1.12

Sig^a test determined with two-sample t test with unequal variancesSig^b significance determined with Linear Probability Model comparison

Difference significance determined with regression coefficient estimates using mean difference values

*p<=.05

**p<=.01

Table 4.5 displays results for the regression analysis of county per capita behavioral inpatient discharges before and after policy implementation. These results address the first hypothesis of the third research question. Consistent with other groupings above, the behavioral health primary diagnosis patient group comprises per capita in-patient hospitalizations for mental health and substance abuse diagnosis in a

county. Due to the insufficient quantities of diagnoses observed for children, they are excluded as a distinctive group in the outcome analyses. Children are, however, included in the aggregate all ages category.

The results indicate a progressive decrease in behavioral health discharges over the policy implementation period. A large, statistically significant decrease in the overall rate of in-patient discharges for all ages and adult behavioral health discharges is evident by 2011. The highest rate of decrease by 2011 was noted for adult mental health discharges, with total mental health discharges showing a similarly large decrease. Inpatient discharges with substance abuse as the primary diagnosis were not significant regardless of age group or time period.

The highest statistically significant decrease ($\beta = -.56$, $SE = .12$, $p \leq .001$), which translates to a 43% decrease, was found for adult mental health primary diagnosis discharges in 2011. By 2011, behavioral health discharges also demonstrated a highly significant decrease of 39% ($\beta = -.50$, $SE = .11$, $p \leq .001$). The decrease in the overall behavioral health practice rate appears to reflect a moderation of the highly significant mental health practices with the much lower and non-significant substance abuse primary diagnosis 2011 discharge rate. Mental health primary diagnosis discharges demonstrated statistically significant reductions of 18% in all ages ($\beta = -.20$, $SE = .09$, $p \leq .05$) and 21% ($\beta = -.24$, $SE = .10$, $p \leq .05$) for adults in 2007. A significant reduction was not detected for substance abuse hospitalizations or the collective mental health and substance abuse category when comparing 2007 to the 2003 pre-implementation rate. However, the 2007 adult behavioral health ($\beta = -.14$, $SE = .07$, $p = .53$) just misses statistical significance. Generally, the greater rates observed for the all age group compared to adult discharge

rates for behavioral and mental health specific groups, suggest that child discharge rates may have seen much lower discharge rate reduction than adults.

The hypothesis is mostly supported. In summary, the total average number of inpatient hospitalizations significantly decreased when comparing 2011 to 2003 rates for behavioral health and mental health primary diagnosis for all ages combined as well as isolated to adults. However, the substance abuse discharge category reported a slight increase for all ages ($\beta = .07$, $SE = .08$, $p > .01$) and adult ($\beta = .05$, $SE = .08$, $p > .01$) in the discharge rate when comparing year 2003 with 2007. While a slight decrease ($\beta = -.04$, $SE = .10$, $p > .01$) in the substance abuse rate was noted when comparing year 2003 and 2011, none of the coefficients reached significance regardless of age group or implementation time period comparison.

Table 4.5: Per Capita Inpatient Adult Hospitalization by Year

Inpatient Hospitalization Primary Diagnosis Patient Group	2007 Change Coefficient	SE	sig	2011 Change Coefficient	SE	sig
Behavioral Health						
All Ages	-0.11	1.58		-0.30	0.08	**
Adult	-0.14	0.07		-0.34	0.08	**
Mental Health						
All Ages	-0.20	0.09	*	-0.50	0.11	**
Adult	-0.24	0.10	*	-0.56	0.12	**
Substance Abuse						
All Ages	0.07	0.08		-0.04	0.10	
Adult	0.05	0.08		-0.08	0.10	
* $p \leq .05$						
** $p \leq .01$						

Table 4.6 attempts to analyze the potential relationship between those counties implementing a higher than median number of evidence-based practices with the

Table 4.6: Per Capita Inpatient Hospitalization for High-Implementation Adult Mental Health Counties by Year

Inpatient Hospitalization Primary Diagnosis Group	2007 High Implementation Level Change Coefficient	SE	sig	2011 High Implementation Level Change Coefficient	SE	sig
Behavioral Health						
All Ages	-0.15	0.147		-0.08	0.18	
Adult	-0.15	0.147		-0.07	0.18	
Mental Health						
All Ages	-0.15	0.15		-0.08	0.18	
Adult	-0.08	0.07		0.01	0.26	
Substance Abuse						
All Ages	-0.11	0.17		0.04	0.20	
Adult	-0.11	0.17		0.05	0.20	
*p<=.05						
**p<=.01						

Chapter Five: Discussion, Assumptions & Limitations, Conclusions, & Implications**for Policy & Future Research**

The goal of this study was to identify and categorize evidence-based practices to distinguish potential implementation patterns and evaluate population-level outcomes. In order to accomplish this goal, the study centered on three research questions requiring development of evidence-based practice implementation process measures to assess practice patterns and evaluating per capita inpatient hospitalization outcome measures. A central theme of this research was to assess whether Oregon's policy mandating use evidence based treatment in behavioral health followed the "rational model" implicit in this policy approach, and thus to what extent other factors outside of this perspective may have influenced policy implementation and/or attainment of policy outcomes.

Traditional models for assessing healthcare quality provide the theoretical foundation for unifying organizational processes with outcome measures. In particular, health quality models assist in relating evidence-based practice implementation process measures with inpatient hospital discharge rate outcomes. A variety of social science based theory was used to develop measures that could facilitate broad investigation of potential underlying organizational and practice related implementation factors and their relationship to policy outcomes. Development of study measures required triangulation of data from a variety of sources including national and regional evaluative databases, as well as a variety of administrative data monitoring practice implementation, county resources, and county level service use.

In the following section, study results are discussed to assess how they do or do not support the “rational model” implicit in this evidence based policy and the theoretical bases for these conclusions. Study assumptions and limitations are then considered to provide guidance on the relative strength and generalizability of the study results. Overarching conclusions are then provided in light of the discussion of results and study limitations with consideration of specific policy implications and potential future research.

Discussion

At a practical policy level, this dissertation evaluates the use of a state legislative mandate as a mechanism to increase county evidence-based practice implementation with the intent of improving behavioral health outcomes. This study explored practice distribution within the defined set of evidence-based practices and tested hypothesized impact on outcomes. Discussion of study findings are evaluated for adherence to general explicit and implicit mandate performance expectations initiating with an evaluation of practice implementation patterns progressing to expected impact on outcomes.

Oregon’s behavioral health evidence-based policy was assumed to mandate a fundamental operating mechanism constraining county practice selection to an evaluated and approved set of potential practices assumed to have consequential impact on outcomes of the Oregon’s state funded behavioral health system. While the policy mandate defined a universe of practice permitted using state funding, it left specific selection of permitted practices, and to some extent identification of permitted practices, up to the discretion of counties. As a result of broad regulatory discretion in county

implementation, counties revealed preferences through selection patterns. This provided a policy environment conducive to testing the extent to which policy implementation followed the expected “rational model” of directing counties towards more uniform practice selection that improved system outcomes or was influenced by other factors. Several theoretically-based measures of practice and county characteristics were developed and applied to analyze county practice selection patterns under the policy and their relationship to expected outcomes. Analysis of these measures suggests a variety of influences at play in county practice selection under the policy, not all of which align with its implicit “rational model” underpinnings.

Process Measure Result: Increase Implementation of Practices

In compliance with the mandate’s explicit implementation schedule, results confirm a titrated increase in county implementation of evidence-based practices over time. This overall increase transcended practice groupings indicative of an implementation distribution extending across the entire set of evidence-based practices. Results also indicate increases for those demonstrating the highest levels of evidence across sub-groups. In the most descriptive example, the highest level of evidence group reached saturation with every practice accounted for in high implementation counties. This general practice increase indicates influences from several literature bases including the evidence-based policy, diffusion of innovation, and institutionalism literature.

Process Measure: Results Counter to the Legislative Mandate Expectations

Several practice implementation results countered legislative mandate

expectations. Institutional theory may explain variations in the rational implementation pattern such as the division of practice selection between high and low levels of administrative complexity. In this manner, it is supposed that counties reacting to mandate uncertainty demonstrate an irrational selection pattern when viewed through an evidence-based policy dominated orientation. However, counties may demonstrate a completely rational implementation selection pattern when analysis is based on isomorphic selection patterns such as mimic isomorphic selection patterns such as those demonstrated by what the county determines as those counties with the most similar characteristics. This may account for the distinction in practice implementation patterns between high and low resource counties. Isomorphic factors may reside among those counties considered to be most similar which may be defined by resource level rather than some other general county characteristic. This result will require additional research to fully interpret the impact of these results.

In a related fashion, contingency theory may explain some of the idiosyncratic selection characteristics displayed by counties. Individual county variation may be a factor of county interpretations of uncertainty resulting in selection patterns deviating from expected aggregate state or population characteristics. For example, a county may experience a rise in public vagrancy which county administration collectively chooses to address through a collection of practices at its disposal oriented to this particular political challenge including evidence-based behavioral health practice orientation. County behavioral health officials may appropriate county resources to address this local concern. This granulate level of county analysis is beyond the current research project.

One of the more potent alternative theoretical models explaining variations from the evidence-based policy model observed in the results is Transaction Cost Economics. This theoretical influence was indicated in the predominate selection of practices exhibiting multiple group characteristics. Practices demonstrating an evidence base transcending groups provide greater population impact at the county level. The preference for implementation of these dual population practices indicates a calculated selection process at the county level warranting further research.

Outcome Measures: Results Supportive of Legislative Mandate Expectations

General outcomes followed mandate expectations. At its most elementary level, increases in county evidence-based practice implementation were followed by a reduction in inpatient discharges. This included an overall reduction in inpatient discharges as well as specifically for mental health adult which includes most established practices. This result conforms to the general intent of the mandate.

Several outcome results did not meet expectations set by the mandate. These results indicate potential boundaries in understanding the potential mechanism linking practices to outcomes. One main question is the exact grouping of practices necessary to detect improvements in outcomes. For example, no reduction was noted for substance abuse inpatient discharges despite the implementation of a significant number of practices. In addition, it is not clear that implementing greater amounts of evidence-based practices related to improved outcomes. Indeed it is not clear inpatient reductions were related to the evidence-based practice mandate.

County implementation characteristics revealed high resource counties

implemented significantly more evidence-based practices when compared to counties with lower resource levels. This result appears to indicate that the quantity of practices implemented related to the level of county resources. Significance was detected at all three time points indicating a high resource county practice implementation preference. This result also indicates that the level of county resources impacts the number of practices implemented. Comparing implemented practices by county resource level and level of administrative complexity reveals a significant difference sustained across all levels. Results reaffirm a significant difference between practices implemented by county resource level for all three levels of administrative complexity.

Assumptions and Limitations

Given the foundation of this research rests on an evaluation of a policy implementation, several assumptions and limitations are associated with this study. Most importantly, this research utilizes evaluative databases and metrics which are evolving. During the time frame of this study, evaluative databases, population health measures, and the application of evidence-based practices in the field of medicine and policy has grown at an expedient rate. Agency evidence-based practice surveys are important given the developmental state of evidence-based practice implementation in behavioral health but regardless are relatively rough measures. Given that these surveys were developed as a legislative control mechanism over mandate policy implementation, this is understandable. However, these rough measures contained no mechanism to capture practice implementation fidelity or another form of verification of practice

implementation. In order to capture state-wide implementation patterns, the administrative database aggregated practices reported by organizations contracted through the county. A more sensitive measure would capture implementation at the organizational and state level. This level of state and organizational process and outcome monitoring has yet to be implemented.

As with any analysis of complex adaptive systems, in which the state behavioral health system qualifies, single events can have compound impact. In a related fashion, certain sentinel outcomes are assumed to provide information pertinent to several administrative and policy levels downstream. While these outcomes provide information, it is important to refrain from over interpreting outcomes without interrelating confirmatory measures which require integrating data sources.

An important limitation of this study is related to the absence of a fidelity measurement in the administration of the county survey. In addition to introducing uncertainty in the measurement of practice implementation there are several broader policy impacts. A fidelity measure provides a modifying element assessing the congruence of practices implemented to criteria linked to the supporting evidence. Lacking fidelity measures functioning to assess implemented practices orients the task of evidentiary review exclusively on the initial selection evaluation occurring during the selection processes. The practice definition at this initial stage impacts future application of a practice to various categorical or outcome-related categories.

For example, a practice described solely on its theoretical basis may have fundamental elements that transcend treatment or age populations. This practice could be included in multiple categories. However, a practice explicitly bound as a derivative of a

theoretical construct developed for a particular age population is distinct to that specific population. Any categorization of emergent entities such as practices can be expected to involve a fluid and evolving evaluation. For the purposes of this study, the impact is an inherent indiscriminate boundary between practice categories. This may help explain the overall effect present when all practices are associated with a model which dissipates when more distinct population outcomes are taken into account.

The overall accumulation of practices may have a population level impact that is not present for particular populations. This rough effect may identify the boundaries associated with targeted outcomes related to evidence-based practice treatment accumulation. There are additional complicating factors related to the detection of outcome effects on population subgroups. The limited number of county-level inpatient discharges resulted in the exclusion of children as an outcome measure. Methodological issues point to further development of general population level implementation and outcome measurement preceding population specific measures.

Conclusions

Results indicate that categorizing practices by population and treatment modality has aided in the interpretation of aggregate selection of practices and potential impact of evidence-based practices on outcomes. The theoretical support for organizational and policy mechanisms operating in evidence-based practice implementation appears more defined. Complexity revealed in results indicates the expectations articulated in language and intent of the legislative mandate may not fully capture the mechanisms at work. In order to influence the policy mechanisms facilitating counties implementing practices

impacting outcomes may require increased research on the categorizing of practice and county attributes in order to target practices to outcomes. Despite displaying an evidence-base, practice's evidence and implementation may need to customize to the intended implementation site, population, and outcome.

Within the study framework, relationships between the various practice and county characteristics need to be more fully understood. Interactions between characteristics may more fully explain variations in results and greater specificity in results. For example, the inconclusive result observed in substance abuse inpatient discharges may be more fully explained when assessing the level of evidence associated with practices associated with this treatment modality. In another example, practices demonstrating highest or lowest level of complexity were found to be significantly different than practices indicative of a medium level of complexity. This appears to indicate an underlying selection preference for high and low complex practices operating at the county level. In an effort to ascertain increasingly nuanced themes, additional difference-in-difference estimates were calculated to compare the number of practices implemented in high resource counties for the low and high and low and medium level of administrative complexity. The results of these difference-in-difference estimates were not significant indicating that the number of implemented practices did not vary by level of administrative complexity.

This study draws several conclusions to guide future implementation research in public behavioral health systems. However, this study also provides guidance for evaluating innovations in the broader public health system. The core question that is

addressed through this research is attempting to further develop the concept of system effectiveness. In particular the research questions are developed at determining policy and system effectiveness in addition to individual provider level effectiveness.

Effectiveness is relative to the perspective of the evaluative instrument. Regardless of the derivation of any chosen definition, effectiveness as originally defined is a core criterion of any forthcoming evaluation. However, the question becomes how is effectiveness defined? Effectiveness defined narrowly may support individual professions or delivery mechanisms while potentially discounting others. Effectiveness defined most broadly includes every outcome aspect and every involved profession and as a result is difficult to interpret. This robust evaluation may exclude articulation with identifiable accountability and therefore serves to transcend professional culpability. Lacking a sufficient public policy instrument that measures process and outcome measures, individual elements of the system define effectiveness. This level of discretion may be out of alignment with expectations for population related outcomes. In fact, this logical supposition is based upon a direct link between research and future programmatic outcomes. This research has illustrated that the relationship between process and population outcome is complicated with several nuances in need of future research.

Implications for Policy

In order to effectively evaluate public policy, significant contextual elements present at the time of implementation need to be sufficiently understood. Evidence-based practice is a relatively recent policy development systematically applied at the health system level. As Evidence-based practices developed further as a system-level policy

instrument, several practical adaptations occurred requiring further explanation to fully inform and provide effective guidance. For example, when the legislative mandate was enacted in 2005, the developing status of databases evaluating behavioral health practices necessitated the state's establishment of a committee for the purpose of reviewing and evaluating provider identified and submitted associated practice evidence base. Oregon's practice selection process consequently initiated without direct intent of providing comprehensive population-level evidence-based practice implementation coverage. Instead, policy implementation relied on the collection of an initial provider baseline of implemented practices.

As a result of reporting implementation progress to the state legislature, the agency conducted a series of three surveys assessing extent provider's implemented evidence-based practices. This normative generating practice review process captured the baseline of implemented evidence-based practices occurring within a county administrative unit. Given the absence of any historical administrative expectation for evidence-based practice implementation, it is anticipated that counties therefore reported practices previously in use and as a result indicate a relatively wide level of county variation. However, by the time of the final agency report to state legislature, the number of surveyed practices narrowed in focus to those determined to be most reflective of initial legislative intent concentrating on practices addressing psychiatric emergencies. It was this final sub-set of psychiatric emergency related practices measured through county self-report documented over all three time points that serves as the data source for practice implementation analyses conducted in this study. This study relies on county reported implementation revealing another important contextual component. Fidelity

measures were not incorporated as a compliance activity at any part of the process. As a result it is the reported implemented practices at the county level which are used to infer outcomes. From a strictly methodological perspective, this study functions through an independently created evidence-based practice measure taxonomy facilitating county practice implementation categorization. This practice taxonomy supports future research and metric development at the individual provider and county levels.

For the individual provider, the taxonomy provides framework and methodology bounding the practice universe. Practice boundaries developed from secondary data gathered from the National Registry of Evidence Based Practice and Program (NREPP) evaluative database are used to apply a descriptive categorization after implementation resulting in permeable identification boundaries. As a result, practice categories are sensitive to authentic practice implementation. While this after implementation application increased grouping and challenges related to malleable grouping, it also resulted in categories sufficient to capture innovative practice applications involving evidence base. In this sense, categories are descriptive rather than prescriptive in their approach to grouping practices. The structure of the grouping is elementary in order to cultivate and accommodate universal dissemination.

The practice taxonomy was developed to identify theoretically significant aspects of population and organizational level treatment level decisions. The level of establishment associated with each practice is determined to evaluate the relative value each practice is expected to have in the selection market. Stated differently, the level of establishment attempts to replicate the level of relative worth of each practice to the implementing organization. The results indicate that there appears to be the presence of

an overall organizational-level decision observed at the county level that indicates a preference among counties organizational units to select practices that exhibit the following practice characteristics: medium-level of establishment, low and high levels of administrative complexity, of practices. This taxonomy captures population characteristics providing market-related information on county and state practice coverage which are then informing outcome expectations. While the basic initial categories are based on broad age and treatment modalities, the categories could be refined to include more distinct categories. While this level of analysis may be useful for the tracking of county adoption patterns, results fail to indicate distinct groupings are able to demonstrate an effect on outcomes.

One important behavioral health system characteristic facilitating potential broader policy direction relates to the complex etiology associated with chronic behavioral health conditions. At the health system level, the frequent interaction between multiple public systems occurring with behavioral health conditions provides a critical test case for several assumptions built into any future comprehensive evaluation of global health system effectiveness and complex health policy interventions. Particular general methodological guidance could be accessed for future incorporation of multiple process data elements for evaluation of complex and long-term outcomes.

Behavioral health represent a diverse set of acute and chronic conditions in which successful outcomes frequently require providers to transcend traditional isolated medical and legal interventions frequently requiring multidisciplinary intercessions. It is these multidisciplinary situations which provide a unique methodological challenge and require multiple data sources and robust measures for accurate monitoring and assessment.

The application of legislative mechanisms to monitor and access collected information to effectively influence service delivery processes and impending outcomes requires active performance monitoring and the use of complex interrelating policy instruments to monitor and influence compliance within a multiple party governance structure. One contributing factor is the involvement of several system and organizational entities. Purposeful interaction between distinct systems such as criminal justice and mental health systems in a sequential approach represent a relatively recent focus in behavioral health intervention research (Munetz & Griffin, 2006). One of the challenging aspects is that behavioral health conditions and associated behaviors transcend traditional areas of agency responsibility despite activating responses across the intergovernmental spectrum with concomitant complex funding structures and separate monitoring systems. It is in these complex interactions between governmental systems that behavioral health serves as a test case for broader health policy reform and interventions. The contextual policy environment provides observations that are useful in complex and non-complex policy environments. In this complex policy environment; it is difficult to establish a baseline from which to determine the effectiveness of the legislatively mandated policy mechanism. At its core, the fundamental challenge exists in defining policy effectiveness. In this environment, the challenge predominately resides in collective stakeholder ability to establish a common definition for policy effectiveness. This definitional challenge operationally compounds when considering policy frequently transcends multifaceted governmental agents and actors. In order to address this elaborate network, a robust evaluation mechanism was developed to capture the inherent behavioral health policy environment complexity. The goal is to address policy effectiveness by means of several

methods collectively capturing inherent estimated nuances in complex implementation situations in order to remain sufficiently sensitive to changes in administrative levels of involvement.

The essential challenge for this study and health policy evaluation in general resides in the fact that system effectiveness can be interpreted from a variety of perspectives. This study defines system effectiveness for a variety of perspectives through the incorporation of several data elements incorporating process and outcome measures. The legislative mandate indicates the expected outcome as psychiatric hospitalizations. These hospitalizations are assumed to be a crisis event resulting from ineffective or non-present preventative interventions. Inpatient hospitalizations are defined as the sentinel event providing an initial estimate on system performance. Inpatient psychiatric hospitalizations provide a discrete measure of system performance. Despite the fact that this measure confines evaluation to a solitary service delivery element in its definition of outcome, this outcome event is the expected consequence of a disease trajectory that is inclusive of subsequent preventative measures. Inpatient hospital discharges provide a reasonable data point to assess behavioral health system performance.

A second aspect of effectiveness is captured in county implementation of practices addressing psychiatric emergencies. This aspect also captures the effectiveness of the legislation as it was drafted. Results indicate reported practice implementation significantly increased across all groups with few exceptions. This indicates that despite the development of the concept of evidence-based practices as a state policy, a uniform distribution of practice types was noted across the identified treatment modality and age

groups. The number of implemented practices did vary when controlling for the three levels of establishment. Practices demonstrating a medium level of establishment were implemented at in significantly elevated numbers compared to the other categories for all three observed time points. This result indicates that counties did significantly implement a greater number of practices compared to those demonstrating the highest or lowest levels of evidence. This gives some indication that counties participated in a pre-implementation practice evaluation either formal or informal when determining which practices to implement an evidence-based practice.

The growth in emphasis regarding evidence-based practices in behavioral health represents a component of general increased demand for accountability and effectiveness transcending all public services. In behavioral health, the reliance on public as the source of funding of last resort combined with interactions with other public systems such as the criminal justice and legal system creates a uniquely public system by default for non-profit earning crisis-oriented services. Therefore, the application of empirically-based decision-making at this level represents a point of intersection between systems and as a result, a critical point from which to assess system effectiveness. Effectiveness can be interpreted as a function of accountability. In this manner, effectiveness can be effectively distilled to the economic role and interaction of principle and agent.

Additional Policy Implications Specific to the Legislative Mandate

This evaluation examines a single agency's interpretation of a state legislative evidence-based practice mandate. A mandate is a policy tool available to the legislature to compel agency action in a particular policy direction. In this application, the

instrument constrained agency processes to document state funds purchasing evidence-based practices. In order to meet this goal, the legislature required periodic reports accounting for the current level of evidence-based practices purchased by an agency. Beyond these constraints, agencies had discretion in the implementation of the policy. While the mandate constrained agencies to report back to the legislature as to the percent of state-funds used to support evidence-based practices it did not constrain the implementation process or provide agencies with implementation funding. However, policy creation and subsequent agency implementation have been historically shown to include contradictory elements that may be loosely integrated with practical implementation (Radin, 2006 Pressman & Wildavsky, 1984; Moynihan, 1969).

Legislative mandates by definition adopt a restricted interpretation of agency discretion. However, by restricting agency discretion toward a particular direction, the act therefore places limits on the actions of those most prepared to interpret and implement the policy. This issue is further complicated when a legislative mandate surrounds a fundamental business process with a stated intended outcome. The result is constraining agency action towards a predetermined conclusion. The more fundamental an agency process, the more influence a legislative mandate may exert on agency processes. The legislative mandate establishes the boundaries of the discussion for future agency action.

In order to pass the legislature, the mandate successfully navigated the various streams and policy window (Kingdon, 1984). However, due to the legislature mandating a fundamental agency process thus impacting a core function of the agency; it also results in the legislature securing limited future control over monitoring and implementation. While the legislative mandate constrained agency processes assuming subsequent

outcome impact, it provided no additional agency structure. A reflection of this power asymmetry is the requirement for agencies to report back to the legislature on a biennial basis as to implementation progress. This reporting process serves as the legislative control mechanism.

While at first glance the mandate may appear to be a rational policy process, the potential exists to orient the process in an irrational manner. Objective methods interpreted in a subjective manner may result in a subjective analysis. Taken farther, objective methods may provide justification for subjective policy decisions. Detecting variations in the implementation of objective methods at a system level requires multiple methods and independent and collective elements fully realizing data limitations. This dissertation is a step, hopefully in an accelerative bearing, toward the potential development of a multilevel model integrating a variety of data elements in an objective manner.

There have been varying integrations of academic research and policy formation which have not necessarily resulted in improved outcomes. In order to assess a potential misalignment between rational intent and irrational results in a timely fashion requires a shortening of the feedback loop between implementation and outcome. This also requires the integration of the applicable level of outcome data. While the evaluation of current practices and the orientation toward evidence-based practices is an important first step, future integration requires accessing state relevant outcome data that contextualizes results to the implemented environment. Evidence-based practices are a function of the implemented environment. As input and process measures are monitored, improving

outcome monitoring generates a potential mechanism from which to calibrate system sensitivity and responsiveness to contextual variations.

This performance management system would require constant dedicated resources and strong data governance mechanisms. This governance model would also have to withstand changes in legislative and agency intent and require continued analysis from lawmakers and agency staff. A question for future policy evaluation is to determine if this is a realistic expectation for state or local government with scarce resources and competing priorities. Whatever the answer to this future policy question, it is apparent from this study that a sufficient working relationship must be developed to obtain reliable data from which to make appropriate policy decisions. The need for a continuing relationship from this study is the requirement for the agency to report to the legislature at three designated time points on the percent of evidence-based practices purchased with state dollars.

Viewed from a public budgeting stand-point, the reporting cycle represents an increase in the dynamics of legislative control. The legislative control cycle can be observed through diminished agency discretion resulting from mistrust, increased legislative supervision and oversight culminating with agency response to tightening controls (Rubin, 2000). As previously stated, while there was agency reporting to the legislative branch, no funding was provided to facilitate implementation. This created a complicated policy space for the agency to operate and solicit county participation. The State of Oregon's funding mechanism provides high levels of discretion to local county entities, which resulted in the agency using the practical and more cooperative approach with counties. Counties also provide funding for treatment and in some wealthy

population centers can provide more funding than the state. Blended funding and county variations in operations creates difficulties in capturing provider purchasing patterns.

This is illustrated by the necessity of the state to contract for an external audit in 2008 to provide an appropriate calculation of county and state funding provided for mental health services (Public Consulting Group, 2008). The reported county mental health resource allocation was used in this study to determine the overall level of resources used at the county including state and county funding sources. The influence of county resource level proved to be significant regardless of the level of administrative complexity associated with a practice.

The practice characteristics developed in this study assist in determining the dimensions providers use to select practices. During the time of this study, practice product information has become increasingly available and visible on a national scale as resources such as the National Registry of Evidence-Based Practices and Programs (NREPP) and other resources become more available to potential practice implementers. While these resources provide information that assist in the decision to implement, in order to ensure sufficient population coverage to cause state-level impacts, state agencies must be actively involved in the development of metrics that span the population in order to ensure equality in treatment coverage that maximizes benefit at the state level. However, given that in this case the state entity does not provide treatment and exerts only limited direct span of control, the exact level of policy intervention may ultimately determine overall policy effectiveness.

The “naïve rational” policy approach must be negotiated in the presence of uncertainty. The parameters of uncertainty only become known when they are

considered. The inclusion of outcomes in the methods of this study was to identify potential outcome boundaries. While there certainly may be discussions regarding the appropriateness of the chosen measures, the goal of this research is to serve as a primary step toward integrating outcomes into the assessment of process measures. While administering process measures may be a valid way of governing agency processes in a third-party environment, it does not necessarily result in intended outcomes.

One particular challenge in need of further exploration is determining the appropriate level of measurement. This challenge became most apparent in the course of constructing outcome measures. Children were excluded based on the fact that county level hospital discharges became unstable at the state level. This challenge became particularly acute when attempting to analyze children for substance abuse as a primary diagnosis for discharge. This becomes apparent when analyzing outcomes but does not necessarily become apparent when operating from an administrative process level. Simply put, it is easy to say that the state needs evidence-based practices for children's behavioral health when there is already a state agency that is committed to that function. However, it is much more difficult to initiate a dialogue determining how much treatment and of what type is needed and where in the state to sufficiently address an issue that impacts the state. Incorporating outcomes into the policy discussion transports the level of need to the forefront. This inclusion of outcome data provides the opportunity to initiate further policy discussions around uncertainty and inconceivability.

Moving toward an outcome influenced policy decision-making process has several challenges that need to be addressed in order to sufficiently inform decision-making and protect against potential governance challenges. Outcomes-based decision-

making may assist in identifying health disparities when they are present. However, the absence of disparities does not necessarily mean that they are not present. Identification of disparities requires analysis of data elements collected for all populations. However, in order to be captured in the data, some populations will need to be displayed at a less aggregated level or rely on an alternative means for data collection. Comparison will need to be conducted at the appropriate level of analysis. At its most basic level, the inability to provide accurate estimates for children in-patient discharges points to the need for data captured at a more appropriate level than the county. Without appropriate outcome data, we are unable to evaluate potential effectiveness. Ideally, outcomes should be tied directly to the service delivery mechanism in order to appropriately gauge system process through-put. Most importantly, the measure can be a variety of quantitative or qualitative measurement types but should reflect system performance on a dimension in which there is some agreement on its importance in the operational health of the system.

An unmonitored population group outcome introduces risk and the potential for perverse incentives to develop in the service delivery system. This potential for risk highlights the need for integration of measures at various levels and tolerance for uncertainty surrounding effectiveness. Outcomes are only sufficient for those individuals that are available for monitoring. This becomes a bigger challenge when attempting to address population characteristics such as county measures reported at the state-level. In order to be effective, outcomes must provide information to various levels of process ownership decision-making. While this is a quantitative study including outcomes, it is constructed to identify potential boundaries of the rational model and alternative

influential factors in provider decision to implement a particular practice. These identified factors are where future policy discussions should be focused.

The naïve rational model is shown to inadequately explain the implementation mechanism associated with a legislative mandate. Providers appear to be making selection-choices that while they are quiet rational at the individual organizational level, are not rational at the state level or within the intent of the legislative mandate. Any efforts at establishing a performance-based funding mechanism based on system-level outcomes would appear to serve to intensify existing perverse incentives and process selection patterns. However, outcomes do provide useful information regarding the effectiveness of state-level policy.

The challenge set forth in this dissertation is for a robust model investigating several models in order to more fully evaluate the implementation of a complex public policy. This approach can be extended to a variety of formats. Dror (1994) provides an extreme example in his discussion of critical future decisions points identifying the limitations of strictly probabilistic approaches to decision-making and the integration of constituents in decisions. There is a fine line between collaboration and efficient decision-making that needs to be more fully developed in future research. The results indicate that overly rational interpretations of policies which may ignore competing incentives operating underneath the state policy level may provide counter to intended results. However, in order for this discussion to take place requires the collection and evaluation of outcome data. This data serves as the foundation for future discussions of treatment effectiveness at the population-level.

One area that deserves discussion for future policy implementation is variation in the implementation of the evidence-based practices legislative mandate within the State of Oregon. The legislative mandate was implemented by several agencies in addition to Addictions and Mental Health (AMH). Agencies did not implement the legislative mandate in the same manner. The most striking comparison is with the Department of Corrections (DOC). DOC used a broader view of evidence-based practices integrated with the use of actuarial analysis of risk factors and focusing on cost information (http://www.pewtrusts.org/~media/Assets/2014/11/PSPP_OR_PS_Brief_web.pdf). This alternative approach focuses on creating a feedback loop integrating state level data to inform future decision-making. The main difference is that this alternative approach focuses on prospective decision-making using outcome information accumulated from the specific location thus integrating and contextualizes outcome data with the implemented environment. The application of evidence-based practices through AMH represents the integration of process verified through other populations. The next step would be monitoring population outcomes of practices implemented. This is part of a larger dialogue of how we determine system success and determine how to allocate resources. This dissertation does not assume to provide a policy answer. Rather, this dissertation attempts to initiate a large and complex discussion on policy formation, service delivery, and system effectiveness. In particular, the nuanced rational model proposed is sensitive to contextual differences in service delivery. Simply put, if a practice has demonstrated national effectiveness with a population but there is no functional service delivery mechanism in the state, then there is little to support expectations that the practice will be effective. This elevates discussion from the

establishment of a minimum base-line for practices offered to an integrated performance management system. However, this may be overstating the intentions of the legislative mandate. If the overall intent of the mandate was to focus policy discussion on the use of effective practices and processes, it has resulted in a policy success. The question more resides on determining the level of success of the implementation and establishing next steps. The goal of this dissertation is to initiate a dialogue establishing and integrating existing qualitative and quantitative data in an effort to evaluate the level of implementation success.

Recommendations for Future Study

There are several methodological and research implications for health policy evaluation. One of the issues related to any categorization of practices into more specific groupings such as treatment modality or age is the continual evaluation or evolution of the evidence-base over time. This iterative assessment process is limited by the initial practice definition and evidence-base. Regardless, of the subsequent evidence-base, the initial definition of the scope of a practice influences future evaluation of a practice. The underlying question resides in determining the appropriate level of categorization which is both practically useful to those selecting practices as well as informative to aggregate county and state population coverage and evaluation of impact on outcomes.

The challenge remains in the intervention level of practice information that serves as a useful baseline to function for replication. The evidence-base surrounding a practice or policy is a direct reflection of the primary research used to develop a practice or policy. In order for a practice to establish an evidence-base, it has to be tested on a

particular age or treatment population. Practices more widely defined have the potential to be more widely accepted and adapted for use with supplementary age or treatment populations. The ability for service providers to evaluate and adopt practices has improved as the information evaluating and comparison of practice information has become more available. While this has allowed for comparison of practices at the individual level, the direct impact on observable outcomes is less known. More research needs to be conducted at the population and state level in order to define effectiveness and facilitate implementation at this level. This research program would involve isolating the relative practice characteristics facilitating implementation within a selection market. Compare of practice characteristics requires benchmarking within the applied domain. This research developed a rudimentary population-based taxonomy which can be further expanded to develop behavioral health practice benchmarks.

The next methodological step for this type of public behavioral health system evaluation is the incorporation of fidelity measures into the process monitoring phase. Because of the exclusion of fidelity measures in the administrative interpretation and implementation of the legislative mandate, this research is silent on issues of fidelity. However, the lack of fidelity measures allowed for the development of compensatory measures which may prove sufficiently effective at a later date. For example, lacking a fidelity measure lowered research expectations on the quantity of county practice application. As a result, county implementation measures tracked the dichotomous presence or absence of the practice in a county. This may be a sufficient measure for tracking county implementation. However, it may provide an incomplete picture of county implementation of a particular practice. The core issue is the sensitivity of the

titration of practices doses and the development of measures sensitive to detection of

outcomes related to implementation of evidence-based practices. Without future studies incorporating fidelity measures into assessment, quality of implemented practices remains uncertain.

The expansion of evidence-based practices in replicable form and databases allowing purchasers to select appropriate treatments occurred over the time examined in this study. Comparing process measures with outcomes requires the articulation of measures that results in useful and meaningful information. In addition, there is the question when is the most effective decision point to apply evidentiary criteria. The goal of this research is to develop an exploratory methodology that allows for the integration of knowledge gathered during establishment of the evidence-base with information gathered after implementation. This model could serve as a basis for future development of a continuous outcome monitoring process sensitive to individual and global population considerations. Another potential area of future research is the examination of more nuanced and specific practice characteristics such as the effect size and further distinctions in the population served.

Future research needs to systemize the monitoring of evidence-based practices and the impact on inpatient outcomes for more substantial time periods. However, one benefit of the current evaluation is that the time period avoids substantial state and federal health reform. The most significant recent policy impact relates to modifications to the health delivery system with the potential integration of physical and behavioral health interventions. However, with these potential changes, the methodological issues surrounding the capture of implementation of process measures such as evidence-based

practices and the connection to outcome measures such as inpatient behavioral health discharges increasingly influential in policy decision-making. A developed methodology could integrate monitoring of implemented process measures and assist in the development of outcome reporting related to the processes measures. In effect, the goal of future research is to provide population outcomes related to the implementation of practices with a demonstrated evidence-base for a treatment population. This allows for a development in the use of evidence-based practices as process measures integrating population level feedback. This feedback has the potential to influence policy decision-making and guide resource allocation decisions. Maybe even more importantly, the existence of evaluative databases and outcome monitoring creates the perception that use of evidence-based practices directly relates to population-level outcomes.

The most important aspect in the development of outcome measures is addressing organizational factors that impact implementation in combination with outcome measures. Further integration of organizational level process measures and population level outcome measures are necessary to maximize the use of organizational process measures. In a related fashion, measures with increased sensitivity to sub-population outcomes are necessary to provide useful evaluative information regarding related processes measures. However, it is difficult to isolate practices on individual populations without also analyzing supporting service delivery structure and proxy measures.

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Appendix A: Figure 1 List of information collected from publicly available databases.

Adult (18 and over)
Children (0-18)
MH
SA
Co-occurring
Target Population (diagnosis link for hospital discharge data) 0= not directly linked to MH or SA, 1=SA, 2=MH, 3=both, 4= Juvenile Justice
Manual
Individual (one-on-one)
Couple
Family
Group
Paraprofessional Required
Professional Required
Individual Provider lead
Multiple providers required 0= no 1=separate professions required (example medication management with therapy)
Program
Settings (Inpatient, Outpatient, School...)
Inpatient (?) 1=Yes, 1=No
Registry Type 1=National Registry of Evidence-based practices, 2= Evidence Based Practices for Substance Abuse (University of Washington), 3= NREPP & UW EBP 4= Univ Nevada Reno CASAT, 5= CASAT & NREPP, 6= Univ. Colorado Blueprint Non-violent program, 7=Univ Nevada Reno & Univ. Colorado Blueprint
Supporting research if available 1= Yes, 0= No, Additional research added into comment
Nrepp Only Measures
NREPP Multiple Outcomes 1 = Yes (added into comments_
NREPP Outcome Ratings (0-4 scale) First Outcome
NREPP Ratings (0-4 scale) Second Outcome
NREPP Ratings (0-4 scale) Third Outcome
NREPP Ratings (0-4 scale)Fourth Outcome
NREPP Ratings (0-4 scale) Fifth Outcome
NREPP Ratings (0-4 scale) Sixth Outcome
NREPP Ratings (0-4 scale) Seventh Outcome
NREPP Ratings (0-4 scale) Eighth Outcome
NREPP Ratings (0-4 scale) Ninth Outcome
NREPP Outcome Categories

NREPP Costs (required by developer) per person totals
NREPP Costs (Not required by developer) per person totals
NREPP Replications 1=Yes 0=No (studies in comments)
Nrepp Implementation Materials cvx
Nrepp Training & Support
Nrepp Quality Assurance
Nrepp Implementation Overall Rating
Program demand on resources (1=high,0 =low)
U of Nevada (CASAT) Cost Info Only
Comments
Available in Oregon? (1 = Yes, 0=No)
SAMSHA Evidence-Based Practice KIT? (1=Yes, 2=No)
Listed by AMH as an EBP under the MH profession
Listed by AMH as an EBP under the addictions
Listed by AMH as an EBP under Substance Abuse
Listed by AMH as an EBP under Co-Occurring Disorders
Listed by AMH as an EBP under Prevention
AMH identified Fidelity Tools available? 0 = No, 1 = Yes

Appendix B: Health Cost and Utilization Project State Inpatient Discharge Database

Variable
AGE : Age in years at admission
DXCCS1 : CCS: principal diagnosis
PAY1 : Primary expected payer (uniform)
ZIP: Patient zip code
DXCCSn: Clinical Classifications Software (CCS): diagnosis classification

DXCCSn: Clinical Classifications Software (CCS): diagnosis classification

Several diagnostic categories determined to be unresponsive to inpatient treatment were excluded from the final analysis. The following diagnostic Multi-Level CCS – Diagnostic categories were considered mental health: The following diagnoses were removed from the analysis in order to capture those inpatient diagnoses amenable to evidence-based practice treatment.

<http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp>

Removed Categories:

5.4 Delirium dementia amnesic and other cognitive disorders [653]

5.5 Developmental disorders [654]

5.5.1 Communication disorders [6541]

5.5.2 Developmental disabilities [6542]

5.5.3 Intellectual disabilities [6543]

5.5.4 Learning disorders [6544]

5.5.5 Motor skill disorders [6545]

Categories used in analysis:

5 Mental Illness

5.1 Adjustment disorders [650]

5.2 Anxiety disorders [651]

5.3 Attention deficit conduct and disruptive behavior disorders [652]

5.3.1 Conduct disorder [6521]

5.3.2 Oppositional defiant disorder [6522]

5.3.3 Attention deficit disorder and Attention deficit hyperactivity disorder [6523]

5.6 Disorders usually diagnosed in infancy childhood or adolescence [655]

5.6.1 Elimination disorders [6551]

5.6.2 Other disorders of infancy childhood or adolescence [6552]

5.6.3 Pervasive developmental disorders [6553]

5.6.4 Tic disorders [6554]

5.7 Impulse control disorders not elsewhere classified [656]

5.8 Mood disorders [657]

5.8.1 Bipolar disorders [6571]

5.8.2 Depressive disorders [6572]

5.9 Personality disorders [658]

- 5.10 Schizophrenia and other psychotic disorders [659]
- 5.11 Alcohol-related disorders [660]
- 5.12 Substance-related disorders [661]
- 5.13 Suicide and intentional self-inflicted injury [662]
- 5.14 Screening and history of mental health and substance abuse codes [663]
 - 5.14.1 Codes related to mental health disorders [6631]
 - 5.14.2 Codes related to substance-related disorders [6632]
- 5.15 Miscellaneous mental disorders [670]
 - 5.15.1 Dissociative disorders [6701]
 - 5.15.2 Eating disorders [6702]
 - 5.15.3 Factitious disorders [6703]
 - 5.15.4 Psychogenic disorders [6704]
 - 5.15.5 Sexual and gender identity disorders [6705]
 - 5.15.6 Sleep disorders [6706]
 - 5.15.7 Somatoform disorders [6707]
 - 5.15.8 Mental disorders due to general medical conditions not elsewhere classified [6708]
 - 5.15.9 Other miscellaneous mental conditions [6709]

Appendix C: Research Design

Appendix D: Practice Characteristics**Table D.1:** Related Practice Characteristics for Practices with the Highest Level of Establishment

Practices	Level of Administrative Complexity	Level of Establishment	Adult	Child
Co-Occurring Disorders: Integrated Dual Diagnosis Disorders	3	3	1	0
Assertive Community Treatment (ACT)	3	3	1	0
Supported Employment	3	3	1	0
Family Psycho-education	2	3	1	1
Medication Management	1	3	1	1

Table D.2: Related Practice Characteristics for Practices with the Medium Level of Establishment

Practices	Level of Establishment	Level of Administrative Complexity	Adult	Child	Substance Abuse	Mental Health
American Society of Addiction Medicine						
Patient Placement	2	1	1	1	1	1
Motivational Enhancement Therapy	2	1	1	0	1	0
Parent-Child Interaction	2	1	1	1	0	1
Parenting Wisely	2	1	0	1	1	1
Individual Drug	2	1	1	1	1	0
Desensitization and Preprocess (EMDR)	2	1	1	0	0	1
Life Skills	2	1	0	1	1	0
Seeking Safety	2	1	1	1	1	1
Acceptance and Commitment Therapy	2	1	1	0	0	1
Brief Strategic Family Therapy (BSFT)	2	1	0	1	1	1
Multidimensional Family Therapy (MFT)	2	1	0	1	1	1
Second Step	2	1	0	1	1	1
12 Step Facilitation	2	1	1	0	1	0
Helping Women						
Recover/Beyond Trauma	2	1	1	0	1	0
CBT - Cognitive	2	1	1	1	0	1
Motivational	2	1	1	0	1	0
Relapse Prevention						
Therapy	2	1	1	0	1	0
Safe Dates	2	1	0	1	1	1
Multi-systemic Family Therapy	2	2	0	1	1	1
Solution Focused Brief Therapy (SFBT)	2	2	1	0	1	1
Community						
Reinforcement Approach	2	2	0	1	1	0
StrengthFamProg	2	2	1	1	1	1
Positive Action	2	2	1	1	1	0
Improving Mood						
Promoting Access to	2	2	1	0	0	1
Wraparound	2	3	0	1	0	1
Functional Family	2	3	0	1	1	1
Matrix Model	2	3	1	0	1	0
Multidimensional						
Treatment Foster Care	2	3	0	1	1	0
Drug Court, Treatment Court, MH Court, Family	2	3	1	0	1	1
DBT - Dialectic						
Behavioral Therapy	2	3	1	0	1	1
Supported Housing	2	3	1	0	0	1
Incredible Years	2	3	1	1	0	1

Table D.3: Appendix: Related Practice Characteristics for Practices with the Lowest Level of Establishment.

Practices	Level of Establishment	Level of Administrative Complexity	Adult	Child	Substance Abuse	Mental Health
Behavioral Therapy for Adolescents	1	1	0	1	0	1
Non-violent Crisis Intervention Training Program	1	1	1	1	0	1
ApplSuicideIntApp	1	1	1	1	0	1
Cannabis Youth Treatment (CYT)	1	1	0	1	1	0
Moral Recognition Therapy (MRT)	1	1	1	1	1	0
UCLA Social and Independent Living Skills Modules	1	1	1	0	1	1
Supported Education	1	2	1	0	0	1
Buprenorphine	1	2	1	0	1	0
Strengths Model of Case Management	1	2	1	0	1	1
Collaborative Problem Solvers	1	2	0	1	0	1
Parent Management Training	1	2	1	1	1	1
Early Assessment & Support Team (EAST)	1	3	0	1	0	1
Consumer Run Drop-in Centers	1	3	1	0	0	1
Community Reinforcement Approach (CRA) with Vouchers	1	3	1	0	1	0
Pathways to Change	1	3	1	0	1	0