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COMPARING TOTAL EXPENDITURES BY SOURCE OF LONG-TERM
SERVICES AND SUPPORTS

By

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B.S. Business Administration, Barry University
M.P.A., Nova Southeastern University

A Dissertation
Submitted to the Faculty of the
School of Public Health and Information Sciences of the University of Louisville
In Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy
in Public Health Services

Department of Health Management and Systems Sciences
University of Louisville
Louisville, Kentucky

August 2017

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A Dissertation Approved on

July 31, 2017

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DEDICATION

לאדון שלי ומושיע ישוע המשיח, על הגשמת שלו, אלוהים של אלוהים ואת גורל רוח הקודש בשבילי כדי לקדם את התהילה ואת ההערצה.

To my loving, late father, C.M. Corder for instilling in me as a young child the realization that learning is a life-long process and that every encounter in life from one's first breath, to their last, is a learning opportunity.

To my late mother, Hildegard Tschneutter Corder, for teaching me my numbers and to read; it set me free.

To my loving sister, Doriann Mira Corder Smitherman, for giving me purpose, structure and home.

For the hundreds of thousands of patients, beneficiaries and members I have served during the past forty years during my career.

ACKNOWLEDGMENTS

I start this acknowledgment with the Chairman of my committee, Dr. Joseph Benitez. His never-ending patience, guidance and leadership during this metamorphosis, that we call dissertation. Knowing just when offer console and a tissue or being stern. While always offering that guidance with grace, support and protection of my vulnerability. Thank you for not giving up on me, when, at times, I was on the verge of giving up on myself. When I saw your belief, it gave me strength to continue on for just 'one more day'. That 'one more day' grew into a year and a half and my ability to complete my dissertation.

Drs., Esterhay, Taylor and Thornewill, thank-you for years of encouragement, mentoring and counsel. Each of you in your own unique ways would support my excitement and exuberance toward my topic from day one of my enrollment. If I make it to heaven, I will look each of you, as I know unequivocally, that each of you will have front-row seats, as each of you are saints in your own right. Thanks to each of you for molding me into the creature I have now become. I tell everyone, that if you come to this end and have no evidence of change, you will have completed a task, but sadly missed a magical mystery tour journey into another dimension of life.

Dr. Lorenz, thank you for your subject matter expertise, that enabled me to complete the requirements of my dissertation process. I will be ever thankful for your benevolence, kindness and grace in helping me advance on my life-long journey of learning.

ABSTRACT

COMPARING TOTAL EXPENDITURES BY SOURCE OF LONG-TERM
SERVICES AND SUPPORTS

Märesa R. Corder

July 31, 2017

This study compares total expenditures between beneficiaries enrolled in traditional Long-Term Care (LTC) and beneficiaries enrolled in Home and Community Based Services (HCBS) in a Quasi-Experimental Simple Ex Post Facto study utilizing multiple linear regression with inverted propensity score weighting. The results demonstrated, during the two years of the study period, that total expenditures were on average \$14,565.03 (with a p-value of <.0001) **less** for the total two years of the study, for HCBS beneficiaries when compared to their LTC counterparts.

There remains today a belief that expenditures of elderly, dual beneficiaries electing to age-in-place for supported self-care expend less than that of elderly, dual beneficiaries electing traditional institutional LTC. Of forty-one peer reviewed periodicals, there is one that supports that belief, all other literature supports a counter-intuitive reality that LTC is less costly.

In, Q4 of 2013 Florida's Medicaid agency, the Agency for Health Care Administration (AHCA) in collaboration with the state's Department of Elder Affairs (DOEA) consolidated its six aging/elderly programs¹ into their new

¹ The State of Florida had six different aging/elderly programs that were consolidated into the SMMC_LTC program, those six programs were: Nursing Facilities, Aged and Disabled Adult waiver, Assisted Living waiver, Nursing Home Diversion waiver, Channeling waiver and Frail Elder option.

Statewide Medicaid Managed Care (SMMC)-Long-Term Care (LTC) program. AHCA outsourced these programs through competitive procurement to managed care organizations.

Compared to previous studies this study has three unique distinctions:

Composition of expenditure categories—Nine of the eleven other studies compared only LTC costs directly to only HCBS costs. This study includes seven expenditure categories: Ancillary; Institutional—Acute; Institutional—Other; LTSS; Miscellaneous; Pharmaceutical; and, Professional.

Managed care programs—Florida’s SMMC-LTC program is MLTSS with reimbursement methodologies including capitated payment schedules, FFS, pay-for-performance and risk/value agreements; and,

Application of a Domicile Adjustment—In an attempt to adjust for Medicaid’s ‘room and board’ benefit differences between the two cohorts’, a domicile adjustment of -\$831.00 was developed and applied to each month of enrollment for each LTC beneficiary.

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CHAPTER I

INTRODUCTION

"It was once said that the moral test of government is how that government treats those who are in the dawn of life, the children; those who are in the twilight of life, the elderly; and those who are in the shadows of life, the sick, the needy and the handicapped".

*Senator Hubert H. Humphrey
November 4, 1977*

As Medicaid's LTSS² enters middle-age in 2033, it will reach the zenith of demand for its services with the Silver Tsunami (Bartels & Naslund, 2013; Delafuente, 2009) of 76.4 million³ baby boomers (West et al., 2014). As public health and public administration forecasts this heightened demand for MLTSS will sustain for 25 years, (BPC, 2014; S. Eiken et al., 2014; Saucier, Kasten, Burwell, & Gold, 2012) well into 2058.

In preparation for the arrival of the baby boomers state public health offices in increasing numbers have received necessary waiver approvals by the Centers for Medicare and Medicaid Services (CMS) to initiate LTSS programs in their respective states (BPC, 2014; S. Eiken, Sredl, Burwell, & Saucier, 2016).

² Long-term Services and Support (LTSS) was coined by CMS in 2010 after complaints from both sides of the long-term care aisle. Proponents for nursing facility LTC complained to CMS that they were being linguistically rebranded with the term Home and Community Based Services (HCBS). LTC opponents wanted LTC revised to include the in-home service construct. CMS alchemicalized the two terms to form LTSS to represent the two different and separate constructs in a broader construct with two equal cohorts, only differentiated by type of domicile yet, with identical services offered by either provider. Managed Long-Term Services and Supports (MLTSS) is used industry-wide to denote a LTSS program which is contracted by a managed care organization.

³ There was total of 76 million births in the United States from 1946 to 1964, the 19 years usually called the "baby boom." Of the 76 million baby boomers born, nearly 11 million had died by 2012, leaving some 65.2 million survivors. However, when immigrants are included (the number of people coming into the United States from other countries, minus those moving the other way), the number grows to an estimated 76.4 million because immigrants outweighed the number of baby-boomer deaths (BPC, 2014; Pollard & Scommegna, 2012; West, Cole, Goodkind, & He, 2014).

More than 50% of states have operational LTSS programs, with another 25% either seeking waiver approval or having their waiver approvals and implementing their programs (S. Eiken et al., 2016). Eight programs completed major expansions of the LTSS programs in 2014 by moving their programs to MLTSS (S. Eiken et al., 2016). One of those expansion states is Florida through the SMMC-LTC program (S. Eiken et al., 2016).

Generally, programs are built in response to policy developed through empirical conclusion, yet, in the circumstance of the issuance of the Olmstead Decision, the urgency to comply with the ruling surpassed traditional program development. Yet, the Olmstead Decision is multi-dimensional and it made provision for cost containment. Therefore, whereas any consideration of access is dictated by the Decision, there is an increased urgency for advancing theory and methods for measuring total expenditures for cost comparisons of the two cohorts. As to date research is limited with the preponderance of that research having been conducted in the Fee-For-Service, pre-MCO milieu (Broyles, 2014; Carcagno & Kemper, 1988; Grabowski, 2006; J. Guo, 2013; J. Guo, Konetzka, & Manning, 2015; C. Harrington, Ng, & Kitchener, 2011; Kitchener, Carrillo, & Harrington, 2003; Shireman & Rigler, 2004; Skellie, Mobley, & Coan, 1982; Weissert, Cready, & Pawelak, 1988; Weissert, Musliner, Lesnick, & Foley, 1997). Additionally, public health leadership was confronted with a temporal encumbrance in that from when the programs transition, it can be a couple of years before the program is producing data adequate for research. As in programs like Florida's Statewide Medicaid Manage Care (SMMC) – Long-Term

Care (LTC) program, it only initiated in October 2013. It would be unfair to collect data during implementation, as there are many operational issues that must be resolved and researchers need data from which to adequately represent steady-state operations upon which to infer causation.

With the rapid growth of these programs and expansion within the existing programs it is beneficial to have current studies to facilitate sound empirical-based decision-making by public health officials. This Quasi-Experimental Simple Ex Post Facto study is conducted on SMMC-LTC enrollees that are, dual beneficiaries living in South Florida. This study compares total expenditures between beneficiaries enrolled in traditional Long-Term Care (LTC) and beneficiaries enrolled in Home and Community Based Services (HCBS). It is designed to compare total paid expenditures for two Fiscal Years (FY) – FY 2014-2015 and FY 2015-2016. This study is a Public Health Sciences – Health Management study utilizing multiple linear regressions with inverted propensity score weighting methods.

Although counterintuitive, of the forty-one studies on cost comparison of equal to or greater than sixty-five-year-old, dual beneficiaries, forty⁴ demonstrated that institutional-based LTSS beneficiaries' expenditures are less than the Home and Community Based Services (HCBS) counterparts. With the expansion in Florida's programs and conversion to MLTSS programs, this quantitative study will provide empirical findings on the expenditure between

⁴ There are actually eleven studies reviewed for this study. One of the eleven studies conducted LTC to HCBS cost analysis on thirty different studies from 1960-1988. All thirty of those studies evinced the same results, that HCBS expenditures were greater than the control-LTC.

those beneficiaries who reside in Long-Term Care (LTC) facilities and their HCBS counterparts.

1.01 Background and Context

1.01.a The Olmstead Decision's Impact

Prior to the enactment of the Social Security Act - 1981 amendment authorizing the 1915 waivers, LTSS could only be rendered in Medicaid certified nursing facilities⁵. Immediately post enactment of the 1915 waivers, services requested for delivery outside a Medicaid certified nursing facility were awarded through a 1:1 exception process (Combs-Orme & Guyer, 1992; Hevesi, 2012). The exception processes not only differed between states but differed between counties within a state (Hemp, Braddock, Parish, & Smith, 2001). This was standard operating procedure until in 1995, L.C. and E.W., two women in Georgia, sought relief of this process by filing suit against Tommy Olmstead, the Georgia State Commissioner of Human Resources. *Olmstead vs. L.C. and E.W.* reached the Supreme Court in 1999.

In synopsis, Justice Ginsburg wrote that the Title XIX requirement of institutionalization in a certified nursing facility to receive PCS from the 1965 Social Security Act was diametric to 'integration mandate' of The Americans with Disabilities Act of 1990. Additionally, "this unjustified segregation of people in institutions, when community placement is

⁵ The 1965 Social Security Act Amendment that enacted Medicaid, clearly stated that PCS could only be provided in Medicaid certified nursing facilities.

appropriate constitutes a form of discrimination prohibited by Title II of the ADA.”, which contained an “integration mandate”.

The Olmstead Decision provides the beneficiary with the right to elect the least restrictive domicile in which to receive services. Additionally, it requires that the beneficiary or their primary caregiver, Member Representative or Power of Attorney maintain direct control of the beneficiary’s Plan of Care for MLTSS. Justice Ginsberg did offer one caveat; the provision of LTSS outside of an institution had to remain within “reasonable accommodations”. The caveat has yet to be clearly defined and remains open to interpretation.

Until the Olmstead Decision, LTC programs for all practical purposes consisted of only those people institutionalized in Medicaid certified nursing facilities. To give the reader perspective, the state of Tennessee as it moved from a solely a LTC program to MLTSS in 2012, the case mix ratios of LTC members to HCBS members was $\geq 98\%$ to 2%, respectively. In two years, those same case mix ratios shifted to 72% to 28%. This represents a ‘rebalancing,’ which is a goal of MLTSS.

1.01.b Florida’s SMMC-LTC Program

MLTSS benefits are supported self-care in the form of PCS⁶s. PCS encompasses services to meet the Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) functional needs of the

⁶ Personal care services (PCS) means, for the purposes of regulating personal care facilities, assistance with or supervision of essential activities of daily living such as eating, bathing, grooming, dressing, and ambulating, and the supervision of self-administered medication and similar services (LeBlanc, Tonner, & Harrington, 2000).

beneficiary. Any of the ADLs, (e.g. bathing, dressing, toileting, transferring, continence control and eating, etc. (Branch, Katz, Kniepmann, & Papsidero, 1984; Evashwick, 2001; Katz & Akpom, 1976; Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963)) or IADLs, (e.g., managing money, telephony, grocery shopping, personal shopping, using transportation, housekeeping and/or medication management (Branch et al., 1984; Evashwick, 2001; Katz & Akpom, 1976; Katz et al., 1963; Pratt, 2004)) can fall on a continuum from independent performance by the beneficiary to complete care of the beneficiary, see Appendix B, for LTSS Covered Services by Cohort for a comprehensive list of standardized LTSS.

ADLs and IADLs deteriorate to different levels of deficiency based upon each individual's aging process (Evashwick, 2001; Katz & Akpom, 1976; Katz et al., 1963). ADL's deteriorate in the reverse order as they are acquired during normal development. If deterioration deviates from the reversal of the order of acquisition, the etiology of that deterioration is not simple aging, but is secondary to pathology (Branch et al., 1984; Evashwick, 2001; Katz & Akpom, 1976; Katz et al., 1963). This is the importance of a thorough comprehensive needs assessment – to ascertain the beneficiary's capacity to perform ADLs and IADLs by accurately identifying the beneficiaries' unique placement along a supported self-care continuum and the natural support(s) currently facilitating the supported self-care.

If a gap develops between care need and care performance, there is a *care gap*, requiring closure by MLTSS. Although Long-Term Care was part of the original 1965 Social Security Act Amendment, Title XIX has had numerous amendments over the past 50 years (S. S. Eiken, D., 2005; P. R. Kongstvedt, 2001). HCBS did not become a part of Title XIX until 1981 with the original amendment including §1915 (a) – (c) (CMS, 2016). Today, §1915 has grown from the original three sub-sections to 11 subsections (CMS, 2016).

With each of these subsections, the program is evolving; from traditional LTC services restricted to only institutional custodial care, to today's HCBS programs where beneficiaries age-in-place in their communities, hire and manage their own direct service workers and in some cases, maintain their own reimbursement accounts, through consumer/participant direction. Additionally, LTC beneficiaries can migrate to HCBS, through repatriation⁷, back into the community just as HCBS beneficiaries can elect to become a LTC beneficiary by moving into a LTC facility. Assignment to either MLTSS cohort is at the election of the beneficiary with no traditional restrictions of open/closed enrollment periods or special event criteria.

The actual structuring and operations of the programs have also evolved from local and regionally operated programs with state and

⁷ Repatriation is incentivized by the state to the MCO, to encourage the transition of members residing in LTC back to the community. This is oftentimes to encourage rebalancing between the case mix between LTC and HCBS beneficiaries.

federal oversight to being outsourced by state procurement administrative rules. States have retained the authority to determine Medicaid and its MLTSS program eligibility for enrollment of qualifying beneficiaries. Most states separate eligibility determination through their welfare determination department/agency and the delivery of services through the state's Medicaid department/agency or the contracted MCO.

Today's MLTSS programs are outsourced Medicaid programs contracted to multi-billion-dollar Managed Care Organizations (MCOs). The 1981 Social Security Act Amendment §1915(a), §1915(b) and §1115 allowed States to outsource by contract their MLTSS. In 2004, there were eight states with MLTSS(BPC, 2014; S. Eiken et al., 2016; Saucier et al., 2012). In 2012, that expanded to 16 and in another two years, it expanded to 26 states with MLTSS programs (BPC, 2014; S. Eiken et al., 2014; Saucier et al., 2012). Approximately 18 more states are working with their legislatures in attempt to move into MLTSS programs (BPC, 2014; S. Eiken et al., 2016; S. Eiken et al., 2014).

1.01.b.i SMMC-LTC MLTSS Eligibility and Enrollment

State of Florida's Agency for Healthcare Administration's (AHCA⁸) Statewide Medicaid Managed Care (SMMC)-Long-Term Care (LTC) eligibility is two-fold. The first requirement is financial means testing in which the beneficiary must be proven to be Social Security Income (SSI)⁹

⁸ State of Florida's Medicaid Agency.

⁹ SSI is categorized as Aged, Blind or Disabled. The income limit per individual is 2,199.00 or 4,398.00 per couple and total assets per individual 2,000.00/ 3,000.00per couple. 209-B spend down determines a

eligible or meet eligibility through 209-B which provides the beneficiary with the ability to spend down their income to meet Qualified Trust requirements (United States Department of Health and Human Services, 1985b). Upon meeting those qualifications, the beneficiary must then meet Florida's Nursing Facility Level of Care (NFLOC)¹⁰.

Meeting FL's NFLOC is the state's way of ensuring that the 1915(c) Waiver obligations is met, confirming that the member is imminently facing institutionalization. To ensure high compliance with the waiver requirement, the state takes these processes very seriously to prevent recoument by CMS, if the state eligibility processes do not adequately meet the imminent admission criterion.

In Florida, a Comprehensive Assessment Review and Evaluation for Long-Term Care Services (CARES)¹¹ conducted by the Department of Elder Affairs (DOEA) determines the imminent admission criteria. A Registered Nurse conducts the actual assessment. If the member is

monthly patient responsibility amount that the beneficiary must pay each month, prior to becoming eligible.

¹⁰ Since LTSS only covers non-medical PCS, traditional Medically Necessary thresholds for approving services are not applicable/appropriate. Each state has its own NFLOC which determines need and qualifies beneficiaries for eligibility and hence enrollment. Florida's NFLOC is comprised of five standards, which only one must be met;

- a. Some assistance with at least five ADLs;
- b. Some assistance with four ADLs and assistance with medications;
- c. A diagnosis of Alzheimer's or dementia and some assistance with three or more ADLs;
- d. Total assistance with two or more ADLs; or

A degenerative or chronic condition requiring daily nursing services (Mitchell, Salmon, Polivka, & Soberon-Ferrer, 2006)

¹¹ The equivalent to Medical Necessity in MLTSS is demonstrated need as determined through a comprehensive needs assessment. In Florida, this is the CARES assessment. This type of assessment not only determines need but also captures natural supports currently filling those needs. An unmet demonstrated need caused by the lack of a natural support to fulfill that need is the definition of a *care gap* for which MLTSS programs are authorized to close. MLTSS is authorized to supplement supported self-care for Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL). It is not intended to supplant that care.

determined eligible, the next monthly MCO eligibility file transmittal will contain the LTSS marker and, an AHCA assigned waiver-code, indicating new enrollee(s) eligibility for enrollment into the SMMC LTC program.

Within five days from the first day of eligibility, the MCO's Care Coordinator/Care Manager (CC/CM) visits the beneficiary for comprehensive needs assessment, determination of services, development of a Plan of Care (POC), and issuance of appropriate service authorizations to the Nursing Facility (NF) or HCBS providers. This POC determines the services to be provided and acts as the official 'service plan' for the member. The service plan also includes the schedule of services, back up plans, and emergency plans to ensure that the member is covered as necessary for PCS and all other appropriate LTSS benefits.

The member elects whether their LTSS are provided within a Nursing Facility (LTC) or within the community through Home and Community Based Services (HCBS). The CC/CM acts as the beneficiary's advocate, or concierge, to ensure the members receipt of services in a timely and appropriate manner. The CC/CM works collaboratively with the member/caregiver to build a POC that most appropriately meets the beneficiaries' needs. If the CC/CM determines the beneficiary is mentally incapable to make these decisions, the primary caregiver, a spouse, child or Member Representative may make the determinations. Otherwise, the beneficiary must have a Medical Power of Attorney (POA) or court appointed guardian to make these decisions.

CHAPTER II

2.0 LITERATURE REVIEW

“Empiricism and idealism alike are faced with a problem to which, so far, philosophy has found no satisfactory solution. This is the problem of showing how we have knowledge of other things than our self and the operations of our own mind.”

*Bertrand Russell (1945) A History of Western Philosophy
Book Three, Part I, Chapter XIII, Locke's Theory of
Knowledge, p. 611*

When looking at previous research for MLTSS cohorts' total expenditure comparison, pre-MLTSS research is valuable to provide context and background. Although there was one MLTSS program before 2000 in Arizona (Weissert et al., 1997), MLTSS reached the national level in the early 2000's with four programs functional by 2004 (S. Eiken et al., 2016; Smith et al., 2016). Programs continue to open, with another fourteen programs projected to complete the waiver, procurement processes and initiate services by 2023, bringing the national total to thirty-eight MLTSS programs (S. Eiken et al., 2016; S. Eiken et al., 2014; Okrent, 2012; Smith et al., 2016). Florida's Medicaid expansion in Q4 in 2013 initiated the Statewide Medicaid Managed Care (SMMC) Long-Term Care (LTC) program. Hence, Florida's SMMC-LTC is now matured enough to provide robust, complete years of research data.

This literature review of LTC/LTSS research will examine peer-reviewed periodicals from the 1980's through 2013 collectively and will end with findings that identify a gap in research, with calls to close the gap with a comparative

analysis between LTC total expenditures and HCBS total expenditures - at the individual level.

2.01 Peer Reviewed Literature

The first expenditure studies were conducted in 1970 through a project funded by the Department of Health and Human Services (DHHS), Health Care Finance Administration (HCFA)¹² for the initial development of a long-term care program that included home and community based services (Applebaum, Christianson, Harrigan, & Schore, 1988; Carcagno & Kemper, 1988; Gottesman, 1981; Kemper et al., 1986; Rathbone-McCuan & Lohn, 1975). HCFA collaborated with Brandeis and Temple Universities and Mathematica, a policy development company on a research project with a goal to advance traditional LTC programs (Applebaum, Harrigan, & Kemper, 1986; Carcagno & Kemper, 1988; Gottesman, 1981; Kemper et al., 1986; Rathbone-McCuan & Lohn, 1975). Included in that modeling were cost comparative analysis between simulation cohorts (Applebaum et al., 1986; Carcagno & Kemper, 1988; Gottesman, 1981; Kemper et al., 1986; Rathbone-McCuan & Lohn, 1975).

The collaboration of investigators, with HCFA, Brandeis and Temple Universities and Mathematica built numerous models simulating various LTC and HCBS models of care coordination/management with service provision processes based on different utilization management criteria, including varying screening/intake processes, plan of care configurations, case mix ratios, care coordination models, care management strategies and financial models

¹² HCFA is the predecessor of Centers for Medicare and Medicaid Services (CMS)

(Applebaum et al., 1986; Carcagno & Kemper, 1988; Gottesman, 1981). These variously configured models of care exploited various scenarios from which they calculated cost comparisons of the simulated populations and with differing program constructs (Applebaum et al., 1986; Gottesman, 1981; Kemper et al., 1986). Literature indicates, with each iteration of a newly proposed program's construct HCBS-based simulations demonstrated lower expenditures than the traditional LTC counterpart simulations (Carcagno & Kemper, 1988; Kemper et al., 1986). These findings scientifically validated for HCFA, the common belief that HCBS was **less** costly (Carcagno & Kemper, 1988; Kemper, 1988; Kemper et al., 1986).

Armed with its model-based study, HCFA had the empirical evidence necessary to move forward for its proposed proof-of-concept pilot program. HCFA procured through RFP the National Long Term Care (LTC) Demonstration¹³ (Carcagno & Kemper, 1988; Kemper et al., 1986). To date the National LTC Demonstration, is the sole national long-term care study. Features of the Demonstration were:

- Budget of 20 Million;

- Originally 12 states secured selection by DHHS, yet only ten went to contract with DHHS;

- Selected states had multiple sites to ensure intra-state population diversity;

- Two care coordination/management models were tested;

¹³ The National Long Term Care Demonstration, is often referred to as the "Channeling Demonstration". Its eminence for the LTSS industry arises as it is the only national study to date. It is considered by the LTSS community as the equivalent of Public Health studies like the 1976 Nurses' Health Study or Framingham Heart Study (Novick, 2008)

Longitudinal, randomized experimental design;

Study population, N-size greater than 6,000; and,

The study ran from planning, development and implementation starting in 1979 through the final state contract terminating in 1986 ((DHHS), 1991; Applebaum et al., 1988; Brown, 1988; Carcagno & Kemper, 1988; Thompson & Burke, 2007).

Even with termination of DHHS/HCFE contracts some states elected to fully fund continuance of the Demonstration model programs. Florida was such a state and only closed the program in 2013, through the Medicaid expansion by AHCA/DOEA moving to MLTSS. Florida used the expansion as an opportunity to consolidate its six aging/elderly programs¹⁴ into their new SMMC-LTC program.

Part of the National LTC Demonstration's function was to conduct comparative analysis between the two randomly assigned cohorts either traditional institutional LTC or HCBS ((DHHS), 1991; Carcagno & Kemper, 1988). Results showed that the only beneficiaries that demonstrated cost-effectiveness were those that were at highest risk for imminent institutionalization and that there were no reliable parameters yet discovered for accurate identification of that sub-population (Carcagno & Kemper, 1988). Being that the results evinced greater cost efficiency for the LTC beneficiaries, it was in direct opposition to the findings from HCFA's modeling study.

Even prior to the National LTC Demonstration's results there was a forerunner in a small study conducted in rural Georgia by a DHHS/HCFE funded Health Services Alternative study (Skellie et al., 1982). This Georgia study

¹⁴ The State of Florida had six different aging/elderly programs that were consolidated into the SMMC_LTC program, those six programs were: Nursing Facilities, Aged and Disabled Adult waiver, Assisted Living waiver, Nursing Home Diversion waiver, Channeling waiver and Frail Elder option.

published its findings as HCFA was completing their waiver approvals, procurement and program initiation of the National LTC Demonstration program ((GAO), 2008; Carcagno & Kemper, 1988). With HCFA, through the Alternative Health Services project and administered by the Georgia's Department of Medical Assistance, the state's Medicaid agency (Skellie et al., 1982). In this 1982 study Skellie et. al included Medicare costs in their comparison analysis.

The study included 172 LTC beneficiaries—the control group, whose expenditures were compared to 575 beneficiaries that qualified for any one of the three alternative services programs: 1. Alternative living services; 2. Adult Day Rehabilitation; or 3. Home Delivered Meals (Skellie et al., 1982). The study's methodology was *t* tests for mean differences (Skellie et al., 1982).

The only significant finding was within the experimental group, those that qualified for one of the three alternative services, pharmaceutical expenditures were significantly higher than the LTC cohort (Skellie et al., 1982). Whereas, physician and nursing facility expenditures were lower than the control (Skellie et al., 1982). Total expenditures for the experimental cohort were \$90.00 per month greater than the control, demonstrating, that LTC expenditures were less than expenditures for those aging-in-place within the community (Skellie et al., 1982).

Of course, this was also in contrast to the HCFA's finding in the modeling study. This article published just as DHHS/HCFA's procurement of the nationwide study neared implementation.

During the ensuing 25 years forty-one studies were performed with each study's outcome replicating the National LTC Demonstration's findings

(Carcagno & Kemper, 1988; Skellie et al., 1982; Van Houtven & Norton, 2004; Weissert et al., 1988; Weissert et al., 1997). Then, in 1988, Weissert et. al looked collectively at thirty of the forty-one HCBS comparative costs studies from 1960 through 1988-which included over 700 citations-for comparative analysis to determine cost efficiency of home and community care (Weissert et al., 1988). In the end, Weissert et. al showed that in all 30 studies, when controlled-HCBS expenditures **exceeded** LTC expenditures (Weissert et al., 1988). Upon publication, Weissert et. al's findings were not well received. Concurrent to the study were two culturally altering political movements that were actively advocating HCBS¹⁵.

Then in 1997, Weissert, et. al conducted an expenditure analysis on the nation's first MLTSS program in Arizona, where elderly services initiated in 1989 (Weissert et al., 1997). The study population was developed from logistic regression estimations using: 1. Case mix between LTC and HCBS beneficiaries; 2. Expenditures from claims history; and, 3. A logistic regression-based risk factor was developed and applied to HCBS members to stratify the experimental cohort for assessed risk for LTC institutionalization (Weissert et al., 1997). By comparing observed expenditures to the estimates, if those same

¹⁵ Politically, during this era, there were two forces being applied to this newly evolving discipline. First, the 1980's was the emergence of the nascent independent living movement for physically disabled (Nielsen, 2012; J. P. Shapiro, 1993). Although this movement started for young adults wanting to be mainstreamed in university populations and no longer be isolated in special disease/disability specific institutions, (e.g., Massachusetts Asylum for the Blind, Gallaudet University, Alabama Institute for Deaf and Blind, Kentucky School for the Blind, Missouri Schools for the Severely Disabled, etc.)(J. P. Shapiro, 1993), the elderly and Intellectually and Developmentally Delayed (IDD) populations quickly joined the movement (Nielsen, 2012). Simultaneous to this was the equally influential and powerful attack by Reagan's administration on government intrusiveness into citizen's daily life and his administration's movement toward deregulation. Regan wanted people empowered to self-determine their own lives and destiny, without intrusion of the federal government (Blumenthal & Morone, 2009; Combs-Orme & Guyer, 1992).

beneficiaries were institutionalized, it evinced a \$4,605,831 savings by substituting HCBS for LTC institutionalization (Weissert et al., 1997). Another and new emergence in study findings, yet it must be reiterated this was the first and so far, only MLTSS study (Weissert et al., 1997).

In 2003, Kitchener, et.al's publication, the study uses states as the unit of analysis (Kitchener et al., 2003). Using random-effects panel regression model estimation tests, that measure the effects of the independent covariable interstate, rather than a fixed-effects model that tests difference within states (Kitchener et al., 2003). This is one of two studies that use CMS 372¹⁶ forms to estimate the study population. Moreover, as noted in the study, the range of 1999 expenditures per capita varies widely from \$114.00 in Vermont to \$0.10 in Washington, DC (Kitchener et al., 2003). The data does not provide utilization correlation with expenditures, therefore it is not possible to deduce if the states with higher expenditures are paying for more benefits or paying more for an equal amount of benefits than states reporting less per capita expenditures. In the end, the final results demonstrated higher HCBS expenditures as compared to the control group-LTC.

Then In 2004, Shirerman and Rigler, utilized both Medicaid data and elected to include Medicare cross-over claims, for institutions, outpatient providers, pharmacy and nursing facility charges into expenditure calculations.

¹⁶ CMS Form 372 is the form from which the state submits to CMS for their matching funds. Although there is another CMS form submitted monthly for encounters, Form 372 is submitted annually. The Form 372 must then be reconciled with the monthly reporting. There are high error rates in the data submitted on the 372. Historically, there has been a two year back-log on processing of the forms. Congressional record in 2013 that the back-log has grown to five years. The Senate is looking to close this loop-hold to increase accountability (Cherrof & Warshawsky, 2013). The authors do not indicate their source of the 372s but the timing appears that the forms are not reconciled.

The investigators elected, yet did not share the rationale in the study to exclude all other Medicare expenditures (Shireman & Rigler, 2004). Shireman, et. al. suggested that HCBS expenditures were \$1,281.00 less monthly than the control group-LTC. Yet, when they applied an adjustment to control for the 'room and board' benefit difference between the two groups, the difference dropped to \$650.00. They then elected to review medical claims and determined had they applied all Medicare expenditures, there would be a difference greater than \$650.00 reflecting that LTC were less than HCBS (Shireman & Rigler, 2004).

Reviewing four different LTSS program models: 1. Medicaid HCBS; 2. Consumer Directed Option HCBS; 3. Capitated LTC; and, 4. Case Management for dementia beneficiaries, across three states: 1. Colorado; 2. Oregon; and, 3. Washington utilizing unpublished manuscripts is the framework of Grabowski's 2006 study (Grabowski, 2006). Methods of the studies ranged from multivariable actual expenditures compared to estimations of projected spending to multivariable analysis using two comparison groups to the control LTC. The first comparison group were dual eligible beneficiaries that live in geographic region where programs were offered but beneficiaries elected not to participate (Grabowski, 2006). The second comparison group were dual beneficiaries living in counties where programs were not offered (Grabowski, 2006). Grabowski in the end was unable to definitively conclude that the programs decreased expenditures (Grabowski, 2006).

Harrington, Ng and Kitchener's 2011 publication *Do Medicaid and Community Based Service Waivers Save Money?* exemplifies a danger of

estimations (C. Harrington, & LeBlanc, A. J., 2001; C. Harrington et al., 2011).

This is the second of two studies that elected to use Form 372²² for the foundation of their estimated population. The estimation process for this study was so complex and convoluted one wonders how replicable the method is and its probability of finding adequate sample size to ensure statistical significance. When populations for LTC are over estimated and costs of HCBS are underestimated, bias is introduced therefore effecting results if the bias is not identified and controlled.

There are two final concerns with this study, the first being the amount of savings attributed to HCBS utilization in a LTSS program and the timeliness in Harrington et al's reporting of their results. First, there is a simple 'whiff test' and the total amount of savings by discrete category in this article should make even a novice student question the amount of savings offered by the researchers. In Figure 3 on page 207, the study reports \$110,348.00 savings annually for institutionalized pediatric beneficiaries. If one does not question the amount, then most certainly one must question timeliness of reporting the results. As we have not institutionalized children in the United States since the 1960's.

2.02 Individual-Population Health-Based Analysis

Best stated by Robert Kane¹⁷:

“Ironically, although we celebrate evidence-based practice in some spheres, this shift in LTSS occurred with little or no empirical

¹⁷ At the time of this quote, Dr. Kane had an endowed Chair of Long-Term Care and Aging at the University of Minnesota, School of Public Health, Minneapolis, MN.

evidence of its efficacy or comparative effectiveness.” (R. A. Kane, 2012)

Additionally, questioning the need to look at expenditures for the MLTSS population from a more global perspective by ceasing to continue simply comparing LTC expenditures to HCBS expenditures. Kane offers also the importance of eventually, expanding study to determining the optimal case-mix between LTC and HCBS to maximize opportunities (R. A. Kane, 2012; R. L. Kane & Kane, 2012).

Finally, Guo’s 2013 dissertation and article echoes Kane’s observation by citing that Medicaid is the number one payer of HCBS, yet the efficiency of the programs are not yet documented at the individual level (J. Guo, 2013; J. Guo, Konetzka, & Manning, 2015; Smith et al., 2016). This makes the case for individual- population health-based public health management sciences analytic studies.

Here is a perfect application of the newer econometric, Instrumental Variables methods. Guo determined that utilization of HCBS significantly reduced costs, but only partially off-sets utilization and Medicaid expenditures of LTC (J. Guo, Konetzka, & Manning, 2015). The study was conducted on a convenience sample of data from 1998-2002 that was comprised of 1402-control beneficiaries and 1,408-experimental beneficiaries.

2.03 Collective Trends in Current Literature

From the literature review emerges four trends in peer-reviewed literature. Having identified those trends, it will facilitate building a much stronger study methodology for this study. Those four trends were:

Operational Model—Forty of the forty-one collective studies were conducted on LTC or LTSS programs that were un-scalable colloquial, locally or regionally administrated. Oftentimes, the providers of actual direct-level service providers were also the professionals assessing the beneficiary for need and assisting the beneficiary with development to their Plan of Care. Only Weissert's 1997 study of the Arizona program was an MLTSS study.

The LTC/LTSS predecessors of MLTSS did not offer commonly used managed care controls and processes, (i.e., econometric analysis, predictive algorithms, utilization management parameters and evidence-based wellness and healthcare all which enhance the beneficiaries' experiences and opportunities to reach optimal health and wellness functionality. Florida's SMMC-LTC has migrated to the managed care milieu-MLTSS.

Reimbursement Methods-Previous studies compared expenditures in a Fee-For-Service (FFS) only environment. Whereas, pre-MLTSS remuneration was transactional, managed care is moving from discrete transactional encounters to reimbursement schemes which are more healthcare-centric. Seeking outcomes versus transactions for measurable increases in the beneficiary's health/wellness (Blumstein & Sloan, 2000; Hurley, Freund, & Paul, 1993; P. R. Kongstvedt, 2001). These migrations from transactional payments include managed care alternative reimbursement methods, (i.e., pay-for-

performance, risk pools, outcome based contracting etc.) (P. R. Kongstvedt, 2001; P. R. Kongstvedt, 2009; Libersky & Verdier, 2014; Okrent, 2012). The SMMC-LTC program includes capitated payment cell strategies, FFS, provider risk/value contracting and pay-for-performance.

Expenditure Types-Only two of the forty-one studies, Skellie, et. al, included Medicare claims. One included crossover claims for four expenditure categories other than LTC/LTSS and HCBS expenditures. The other used Medicare claims for inclusive health and wellness expenditures. The other thirty-nine studies in this literature review made no consideration for total health and wellness expenditures. The Florida SMMC-LTC study will include all relevant health and wellness total expenditures for a total of seven categories: ancillary, institutional-acute care, institutional-other, LTSS, miscellaneous, pharmaceutical and profession for full consideration in the study.

Statistical Methodology- At a more global perspective it could be said that most of the studies in this literature review had all the same methodology, regression. Although that is a true statement, the forty-one collective studies had forty-one different epidemiologic-based methodologies. Forever attempting to fit public health managerial studies into the purest of scientific of methods.

With the new operational methods of MLTSS there are new reimbursement methodologies, new considerations of more comprehensive inclusion of expenditure types past the traditional LTC vs. HCBS only studies. So why would there not be considerations of new statistical methods? There must be and they are already entering the public health management sciences field.

Epidemiologic-like framework studies are migrating to more dynamic, effective and accurate econometric-based studies.

The Random Control Trial studies will forever remain the gold standard for medical, pharmaceutical, and disease prevalence and surveillance research. Yet, for public health management sciences there has always been an ill-fit with those methods, effecting the validity and professional acknowledgement, as many of public health management studies are more philosophically aligned with social science studies than epidemiology. Yet, now with Instrumental Variables, Regression Discontinuity Designs, Difference-in-Differences and Propensity Scoring Methods, there are newer more powerful methods, with answers to previous generations' methodological limitations caused from trying to conduct social science studies through Random Controlled Trial methods.

Also, being that so many of these methods have been widely practice in other academic disciplines, they are now widely recognized and as universally acknowledged as case-control, cohort and clinical trial studies They are econometrics and they are moving public health management from weakly causal inference studies like case studies, ecological or cross-sectional studies to powerful causal inference studies.

Broyles, Guo, Fralich, Konetzka, Bowblis and others are showing the discipline of public health managerial sciences that there are far better tools to use from the world of econometrics (Bowblis, 2011; Broyles, 2014; Fralich, 2015; J. Guo, Konetzka, Magett, & Dale, 2015; J. Guo, Konetzka, & Manning, 2015; Konetzka, 2014). This category of methods is far more effective and salient in

meeting the needs of public health leaders to secure causal inference for non-epidemiologic studies.

CHAPTER III

3.0 METHODS

"If a man will begin with certainties, he shall end in doubts; but if he will be content to begin with doubts, he shall end in certainties."

Francis Bacon (1605)
The Advancement of Learning, Book 1, v, 8

At the onset of the methods chapter, it is important to realize that this Quasi-Experimental Simple Ex Post Facto study utilizing inverted propensity score weighting linear regression methods was originally developed by Rubin and Rosenbaum in the early 1980's to advance social science and non-epidemiologic public health studies(S. Guo & Fraser, 2013; Rosenbaum, 1987, 2002; Rosenbaum & Rubin, 1984; Rubin, 1996; Schafer, 1999) . Prior to the use of these methods, studies ineligible for Random Control Trials(RTC) were suspect and their validity and causal inference was highly suspect. That is no longer true, as the type methods used in this investigation demonstrate a leveling of the research fields between RTC and observational studies research.

The research questions for this study are simple. The first is if there is a difference between total expenditures between the two LTSS cohorts? The second is with the application of the domicile adjustment to the LTC cohort beneficiaries is there is a difference in total expenditures. These will be answered by performing inverted propensity score weighted multiple linear regressions, utilizing SAS version University Edition© 2.4. The unit of analysis is each LTSS beneficiary qualifying for study inclusion.

3.01 Phase I: Data Collection

3.01.a Data Source

The data used in this study is from administrative records and actual paid claims for Florida's SMMC-LTC program in Broward and Miami-Dade counties, respectively. The contractor was also the beneficiary's primary Medicare insurer¹⁸. The expenditures reflect total incurred-costs for two fiscal years 2014 – 2016.

The actual data sources are combinations of administrative data and actual paid claims. The administrative data, (i.e., age, sex, cohort assignment) is considered enrollment data transmitted from the state to the contractor in files for enrollment and ongoing care management. The paid claims data is electronically transmitted from AHCA to the contractor upon payment remittance, in response to submitted and adjudicated claims by the contractor. Some of the covariates are calculations derived from the remittance data, (i.e., total number of admissions, length of stay, number of emergency room visits).

The expenditures are from both LTC and HCBS beneficiaries, and are comprised of:

- Medicare (primary) and Medicaid (secondary) reimbursable expenditures for:
 - Ancillary;
 - Institutional: Acute;

¹⁸ Study inclusion criteria required that the study subject had to receive both primary Medicare coverage and secondary Medicaid, as a dual recipient, from the same contractor. This was necessary to secure inclusive primary and secondary claims. Physically disabled beneficiaries less than sixty-five years of age were disqualified, as this study was exclusively for beneficiaries sixty-five and older. Medicare Fee-For-Service beneficiaries were also disqualified, as Medicare claims were unattainable.

- Institutional: Other;
- Miscellaneous;
- Pharmaceuticals: Retail and Specialized; and,
- Professional; and
- Medicaid (primary) reimbursable expenditures for:
 - LTSS¹⁹

3.01.b Domicile Adjustment

HCBS proponents arrogate that HCBS expenditures are less than expenditures for LTC beneficiaries. However, proponents of LTC dispute the claims, as there is measurable inequity of 'room and board' reimbursement. Per CFR 42, there are specific directions for Medicaid reimbursement of room and board for LTC beneficiaries. This is prohibited for HCBS beneficiaries. Hence, in previous expenditure comparative studies, LTC expenditures included room and board payments that are not included in HCBS total expenditures (Carcagno & Kemper, 1988; Grabowski, 2006; C. Harrington et al., 2011; Kitchener et al., 2003; Shireman & Rigler, 2004; Skellie et al., 1982).

To adjust for this difference, affordable housing costs were secured from the United States Department of Housing and Urban Development (Miami-Dade County, 2017). The range of affordable housing in the catchment areas ranged from \$831.00 for an efficiency apartment to

¹⁹ LTSS is not reimbursable by Medicare. Medicaid coverage is primary payer of ALL LTSS. Secondary coverage is unnecessary, as Medicaid is payer of last resort, and providers must accept Medicaid payment as payment in full.

\$2,073.00 for a four-bedroom home. To assure the most conservative adjustment for room and board, it was elected to use the bottom of the range as a domicile adjustment.

For each month that a LTC member was enrolled in the LTSS program, \$831.00 is deducted from their Total Expenditures, through the LTSS Expenditure category. For someone enrolled for one month, that would be a deduction of \$831.00, whereas a beneficiary in the program for the full twenty-four months of the study would receive a Domicile Adjustment totaling \$19,944.00.

For a sense of comparison, a lower-end socio-economic Assisted Living Facility (ALF) monthly rental fee in the same geographic area is \$1,100.00 per month. Supported self-care in the form of Personal Care Services are charged separately for individual services, (e.g., verbal reminding through complete care for bathing, transferring, toileting, medication management, telephony, financial management). Statistical analysis will be conducted with and without the domicile adjustment.

3.02 Phase II: Data Preparation

3.02.a Unit of Analysis

The Unit of Analysis for this study is Total Expenditures for each discrete beneficiary within their respective LTC or HCBS cohort. Total Expenditures is a simple arithmetic sum of all incurred-costs of services or commodities with dates of service between July 1, 2014 and June 30, 2016. Total Expenditures is the aggregate incurred-costs of: Ancillary,

Institutional: Acute, Institutional: Other, LTSS, Miscellaneous, Pharmaceuticals and Professional expenditures.

3.02.b Missing Variables

This is actual Medicaid and administrative data, and those who work in the Medicaid milieu know well the prevalence of missing variables in Medicaid data. Additionally, during Phase I: Data Collection, it was readily evident that there are numerous missing values. The first preparative action was one of simple univariate frequency of missing values and percentages.

The method to accomplish this portion of the analysis is simple rudimentary sorting of the data, whether performed through the statistical software or a simple spreadsheet sort. For each co-variate is sorted by 'missing' or 'not missing' to provide frequency and distribution by appropriate cohort.

Important decisions must be made in advance of the analysis, as it will impact limitations that may be placed on the model moving forward. If a variable unit is missing a variable item, does that disqualify the beneficiary altogether? This is usually inadvisable, especially in this circumstance. When one is working with such a small database (Schafer, 1999), the sample will readily become decimated and potentially lead to statistical insignificance and possibly termination of the study.

Another alternative is to allow the beneficiary to remain in the cohort, and permit their qualification into any variable item whenever there

is a variable unit present. This allows for what data is available to be used. Although more desired than complete disqualification, there are problems, in that though the beneficiary is in the cohort, you can be analyzing different sub-cohorts that may increase bias (Rubin, 1996; Schafer & Graham, 2002). The best alternative is a gift that was given to observational researchers by Rubin in the late 1970's—Imputation.

3.02.c Imputation

Imputation enables the researcher to have a completed database of all variables. (Rubin, 1996; Schafer, 1999; Schafer & Graham, 2002). One issue that arises with the consideration of imputation is that, if it is decided to use imputation, what will be the maximum percentage of missing data that will be permitted to include a variable for imputation (Schafer, 1999; Schafer & Graham, 2002)?

A definitive theory of the maximum allowable percentage of missing data eligible for imputation was not found, therefore using a 'rule of thumb' of 30% was used as the starting point. That 'rule-of-thumb' was expanded to 32% for this study. With this study being only N=1,507, imputation is vital to preserve the sample size, which is imperative to ensure the necessary statistical power of the model. Therefore, imputations will be exploited for this study (Rubin, 1996; Schafer, 1999).

The knowledge of the data, obtained during data collection, is the only knowledge directly related to the database. This is where research experience is imperative, as this decision has multiple implications in that it completes the co-variable selection. Depending on the missing value

prevalence, numerous variables could disqualify if the percentage is placed too low. With the inverse being as impactful (if the percentage is too great), variables may be included that will weaken the statistical power, threatening the study results. Upon consultation with more experienced researchers, a maximum of 32% of missing data was agreed upon for this study. This now allows for the actual imputations to be completed. Multiple Imputations were applied to the following variables:

Sex

Marital Status

AHCA Eligibility Waiver Code

Risk Ranking

Supported Self-Care Continuum

3.02.d Co-Variable Categorization and Definition

Andersen's behavioral model factors are the foundation of this study's categorization of co-variables. Utilizing his variable categorizations (R. Andersen & Aday, 1978; Fleming, Giachello, Andersen, & Andrade, 1984; Weissert et al., 1997), for the framework for this study, the independent variables are categorized as:

Predisposing—The beneficiaries' penchant to use services as suggested by their beliefs about LTSS, along with demographic and social characteristics (R. Andersen & Aday, 1978; R. M. Andersen, Davidson, & Baumeister, 2007). This is the only category which Andersen identified specific variable units for inclusion as foundational predisposing variables

Sex;
Age;
Race²⁰; and,
Marital Status

For this investigation, the AHCA Eligibility Waiver codes are being included, as they demonstrate the beneficiaries' category of eligibility.

Literature indicates that beneficiaries that succeed in Medicaid enrollment are often found to secure access in additional programs and services (Alt & Stewart, 2013; Davidson, 1998; R. L. Kane & Kane, 2001).

Enabling—The ability of the beneficiary to secure LTSS, as indicated by their persona resources and availability of supported self-care. For this investigation, there are three Enabling variables: 1. Member months – the total amount of months the beneficiary was enrolled/participating in the SMMC-LTC during the study period; 2. The length of Medicare enrollment, from first eligibility until the end of the study period; and, 3. Medicaid enrollment, from the first eligibility until the end of the study period.

Literature indicates that the longer beneficiaries are in managed care, their expenditures over time decrease, as they are longer and better managed. This is attributed to both more appropriate level of care, (i.e., seeking triage and care at the primary care provider's office, versus the local emergency room) and reduction in incurred-costs for disease care and co-morbidity treatment in lieu of preventive health care. LTSS benefits

²⁰ Race was disqualified, in this study, per the highest acceptable percentage of missing variable; discussed further in Chapter V, Section 5.03 *Limitations*.

provide social determinant care, in the form of food, ADL and IADL supports. Oftentimes, unmet need in these areas drive impoverished populations to seek more costly health care, as they know hospitals are always warmed/cooled, clean, infestation-free environments. Additionally, hospitals are purveyors of food, hygiene, toileting, transfer assistance and medication management. When unmet gaps in social determinant care emerges, commensurately health care costs rise in the same population. With between 80 and 90% enrollment for the 24-month study period, there is empirical evidence of enrollment stability during the study period. Additionally, this stability is further confirmed by the fact that 61.2% of the LTC and 74.13% of the HCBS beneficiaries were in the program for the entire 24 months, even though Medicaid beneficiaries are notorious for poor follow through to ensure continuous eligibility (Evashwick, 2001; Huber, 2005). Historically, Medicaid beneficiaries average only seven months eligibility per calendar year. (Blumstein & Sloan, 2000; P. R. Kongstvedt, 2001; P. R. Kongstvedt, 2009).

Need – The necessity and level of supported self-care determined per-enrollment by the eligibility determination RN and post-enrollment MCO risk ranking. Unlike medical services, there is not a specific ‘medical necessity’ definition or process. The awarding of LTSS is based solely on the beneficiaries’ ‘demonstrated need’²¹. The Need variables for this

²¹ The beneficiary’s Care Coordinator/Manager (CC/CM) assigns the beneficiary’s Risk Ranking based upon findings from the beneficiary’s comprehensive needs assessment as part of the enrollment process. The Risk Ranking is assigned, at a minimum, annually upon the completion of each comprehensive needs re-assessment. Risk Ranking stratifies beneficiaries into three rankings of risk for institutionalization. LTC beneficiaries, being that they are already institutionalized, are automatically assigned Low. LTC beneficiaries

investigation are: 1. Risk ranking, a score between one and three, measuring respectively, the risk of the HCBS beneficiaries being institutionalized or LTC beneficiaries being admitted to an acute care facility; 2. Supported Self-Care Continuum placement, a score from zero (Independent) through five (complete care) indicated the overall supported self-care the beneficiary requires daily; 3. Number of Emergency Room Visits; 4. Number of Acute Care Admissions; 5. Length of Stay – acute hospitalizations; 5 Number of Other Care Admissions; and 6. Length of State – other hospitalizations. This is the importance of an extremely effective needs assessment - to identify both needs and current natural supports. Wherever there is an identified need without a corresponding natural support to fill that need, there is a 'care gap'. Care gaps of the elderly and physically disabled are the genesis of LTSS. The primary legislative authority for LTSS is for the closure of those care gaps by supplemental, not supplant, services. This is the imperative necessity of a supported self-care continuum quantifies the amount of supported self-care the beneficiary requires, irrespective of domicile.

risk ranked High or Moderate are usually experiencing inpatient admissions into acute care facilities or experiencing changes in condition, (e.g., pattern of recurring falls, incident(s), injury or complaint, reports of abuse or neglect, increased frequency of hospitalization, or prolonged, precipitous or significant change in health or functional status). HCBS beneficiaries are risk ranked for the risk of imminent institutionalization into a LTC facility. An ongoing challenge is that 'imminent admission' has yet to be quantified, and is left to the subjective discretion of the professional/para-professional CC/CM assigning the risk ranking. The risk ranking process is the same for HCBS beneficiaries as LTC beneficiaries. The one difference is the change in condition categories, (i.e., change in residency or primary caregiver, or loss of essential social supports, prolonged, precipitous or significant change in health or functional status, loss of mobility, an event that significantly increases the perceived risk to a beneficiary, or beneficiary is referred to Adult Protective Services because of abuse, neglect or exploitation).

3.02.e Outcome Variable–Total Expenditures

Total Expenditures for each beneficiary within the respective LTSS cohort–LTC and HCBS–include seven categories of expenditures. The balance of studies comparing LTSS expenditures have singularly looked at comparing only LTSS expenditures (Carcagno & Kemper, 1988; Kitchener et al., 2003; Skellie et al., 1982) to one another; HCBS to LTC only or have added singular other Medicaid expenditures (C. Harrington et al., 2011; Shireman & Rigler, 2004). Starting in the early 2000's, studies by Kitchener et. al and Shireman et. al began trying to bring in iterations of inclusions and exclusions of other health care expenditures into their studies (Kitchener et al., 2003; Shireman & Rigler, 2004).

This study expands each cohorts' total expenditures to include all health and wellness expenditures. This investigation includes seven expenditure categories:

- Medicare (primary) and Medicaid (secondary) reimbursable expenditures for:
 1. Ancillary Expenditures–Including, but not limited to Durable Medical Equipment, incontinency supplies/disposables, therapies, (e.g., Speech Therapy, Physical Therapy, Occupational Therapy, etc.), injectable administration, (e.g., intra-arterial, intravenous, intramuscular, etc.), medical/surgical supplies, orthotics, and prosthetics incurred-costs;

2. Institutional: Acute Expenditures—Including, but not limited to acute care facility, inpatient, outpatient or Emergency Room for facility incurred costs;
3. Institutional: Other Expenditures—Including, but not limited to inpatient admission into Skilled Nursing Facility, Long-Term Acute Care or Rehabilitation Hospital for facility incurred costs;
4. LTSS Expenditures by cohort:
 - a. *LTC*-Expenditures for beneficiaries' room and board, and all other custodial and medically necessary treatments in a per diem fee set annually by the State of Florida's Attorney General's office; and,
 - b. *HCBS*²²-Expenditures for beneficiaries' receiving LTSS within the community to age-in-place. HCBS services covered in Florida include, but are not limited to:
 - i. Personal Care Services (PCS);
 - ii. Attendant Care Services;
 - iii. Home Delivered Meals (HDM);
 - iv. Personal Emergency Response System (PERS);
 - v. In-home/Inpatient Respite Services;
 - vi. Home Modification;
 - vii. Incontinence Disposables;
 - viii. Enteral feedings and supplies;
 - ix. Expanded Benefits:
 - (1) Non-Medical, Non-Emergency Transportation - one Non-accruable round-trip transport, monthly;
 - (2) Life-time maximum \$1,500.00 repatriation assistance, (i.e., utility deposits, packing/moving costs, furniture, dishes, linens, etc.);
 - (3) Over-the-Counter (OTC), Non-classified Pharmaceuticals or supplies - \$25.00 benefit monthly, Non-accruable; and,

²² Please refer to Appendix B LTSS COVERED SERVICES BY COHORT, for comprehensive list of LTSS and definitions of each service.

(4) Fresh food supplemental benefit for an additional percentage discount when purchasing fresh foods from specific grocery vendors.

5. Miscellaneous Expenditures—Including, but not limited to accounting adjustments, Fair Hearing adjustments and financial recovery;
6. Pharmaceutical Expenditures—Including, but not limited to Primary and Secondary incurred-costs for any pharmacologic elements (retail or specialty) reimbursed by CMS or AHCA for the five controlled classifications of pharmaceuticals; and,
7. Professional Expenditures—Including, but not limited to incurred-costs for any professional services, (e.g., physician visits, surgical procedures, ophthalmologic procedures, anesthesia administrations and pharmacologic management).
 - And, Medicaid (primary) reimbursable expenditures for:
 1. LTSS Expenditures by cohort, as per # 4 above.

The outcome variable – Total Expenditures is a sum of the expenditures from each of these categories.

3.02.f Study Aims and Hypotheses

The overall objective of this research is to determine, at an individual level, if those beneficiaries electing LTC have greater total health care and LTSS expenditures as compared to their HCBS

counterparts. The first aim, is to determine, at an individual level, if the Total Expenditures, whether presented as total expenditure or Per Member Per Month (PMPM) total health care expenditures, are equal. The primary hypothesis is: H_0 – Total Expenditures for HCBS beneficiaries are no different from Total Expenditures for LTC beneficiaries. H_A – Total Expenditures for HCBS beneficiaries are higher than Total Expenditures for LTC beneficiaries.

The second aim is to determine if an application of a Domicile Adjustment to the LTC beneficiaries only would normalize the differences (if present) in Total Expenditures, caused by a ‘room and board’ benefit difference between the cohorts. The secondary hypothesis is: H_0 – Total Expenditures for HCBS beneficiaries are no different from Total Domicile Adjusted Expenditures for LTC beneficiaries. H_A – Total Expenditures for HCBS beneficiaries are higher than Total Domicile Adjusted Expenditures for LTC beneficiaries.

3.03 Analysis Design

An unintended consequence of the DHHS’s attempt to control for cost neutrality of the newly recognized HCBS expenditures set LTC expenditures as the gold standard, upon which HCBS beneficiaries are measured. Rather than allowing for rigorous academic review for expenditure theory development or free-market forces to set the value, the political motivators of a powerful LTC industry seemingly set the ceiling for those expenditures at the current LTC expenditures. Moreover, this is the rationale for electing the LTC cohort as the control group.

In this study, the average effect of the HCBS beneficiaries' domicile election is being assessed on the cohort's expenditures versus their counterparts in LTC. Here in Phase III: Data Analysis the discussion is focused on the two statistical methods that the data will be exposed to during the final analysis, Linear Regression with Inverted Propensity Score Weighting (IPSW).

3.03.a IPSW Theory

Let D be a treatment binary flag with 1 for treated (HCBS Cohort) and 0 for the control group (LTC Cohort), X be a row vector of confounders for the probability of treatment and outcome, e be the propensity score, and y be the outcome variable. Considering that there are N observed beneficiaries in a sample dataset, where N_u beneficiaries received HCBS services and N_c beneficiaries received LTC services, therefore $N = N_u + N_c$.

The probability of receiving HCBS Services without considering the co-variables is $p = N_u/N$, and the probability of receiving LTC Services is $1 - p$. The propensity score $e_i = \text{prob}(D=1|X_i)$ is the probability of treatment (HCBS Cohort), given the observed covariates X_i . An important property of the propensity score is balancing the observed co-variables across the cohorts or treatment groups (HCBS vs. LTC) (Austin & Stuart, 2015; A. Shapiro, Loh, & Mitchell, 2011).

The estimated propensity score is obtained using the following logistic regression model: $e_i = \frac{\exp^{X_i\beta}}{1 + \exp^{X_i\beta}}$, where β is a vector of parameters to be estimated from a sample of the observed data.

The average treatment effect on the treated (HCBS cohort) can be defined as the difference between the average outcome for the beneficiary when they use the services ($D=1$) and the average outcome of the same users when they do not use the services ($D=0$), that is,

$$ATT = E(Y_t^{HCBS} | D_t = 1) - E(Y_t^{HCBS} | D_t = 0) \text{ (Austin \& Stuart, 2015; Morgan \& Winship, 2015; A. Shapiro et al., 2011)}$$

A beneficiary's weight is equal to the inverse of the probability of receiving the service that the beneficiary received. The IPSW was first proposed by Rosenbaum (Rosenbaum, 1987) as a standardization of the weights. The weights may be inaccurate or unstable for beneficiaries with a very low probability of receiving the services that were received. To stabilize the weights and address the issue, Robins, et. AL. (Robins, Hernan, & Brumback, 2000) proposed the estimate of ATT weights to be (Austin & Stuart, 2015; Lunceford & Davidian, 2004; A. Shapiro et al., 2011):

$$W_{t,ATT} = D_t + \frac{(1 - D_t) * e_i}{(1 - e_i)}$$

IPSW ensures sample comparability and selection bias reduction, and control based on the individual's propensity score, which is particularly useful when there are observed differences at baseline (Posner, Ash, Freund, Moskowitz, & Shwartz, 2001). These scores consist of a single continuous score summarizing multiple dimensions of co-variates.

IPSW would require fewer distributional assumptions about the underlying data, and the estimators would avoid the potential residual confounding that arises from stratification on a fixed number of strata if the Stratification on the Propensity Score were considered (Curtis, Hammill, Eisenstein, Kramer, & Anstrom, 2007).

For this study, there are two general methodological approaches to estimate expenditures of this LTSS program: Propensity Score and multivariate regression, each discussed separately below.

3.03.b Application of IPSW

The propensity scores estimation of a logit model of the program participation status ($D = 1$ for HCBS beneficiaries and 0 for LTC beneficiaries) will be obtained with a set of observed characteristics, (e.g., age, sex, marital status, AHCA eligibility waiver code, member months, years enrolled in Medicare, years enrolled in Medicaid, risk ranking, placement on supported self-care continuum, # of ER visits, # of acute care hospitalizations, length of stay-acute care, # of other care hospitalizations, length of stay-other care). Many of these co-variates are high predictors of nursing home entry and health care utilization (Borrayo, Salmon, Polivka, & Dunlop, 2002; Liu, McBride, & Coughlin, 1994). The propensity score for an individual i is the predicted probability of the individual being a service user, or $p_i = D_t$.

3.03.c Analysis – Multiple Linear Regression

Prior to analysis, all the categorical independent variables were dummy coded. The assumptions for multiple regression include: (a)

variables are normally distributed in the population, (b) linear relationship between the independent and dependent variables, (c) homoscedasticity is present, (d) cases represent a random sample from the population and scores on variables are independent of other scores on same variables, and (e) no multicollinearity exists.

Regarding homoscedasticity, one should assure that the residuals are dispersed randomly throughout the range of the estimated dependent. Homoscedasticity will be tested for all dependent variables by examining a homoscedasticity scatter plot obtained in the multiple regression procedure. The assumption of multicollinearity will be assessed by examining the Tolerance and VIF.

CHAPTER IV

4.0 ANALYSIS AND RESULTS

In Life
Some mock me for doing statistics
Some loathe me and statistics
Some don't understand what statistics are
Why is it that statistics
Put a calm smile on my face?
Because of statistics I can solve the deepest mysteries
Because of statistics I will not be lonely again, playing in the data
Because of statistics I can rearrange the stars in the skies above
Love the Motherland, Love Statistics by Chinese statistician Wang Jiaowei
[translated], The Wall Street Journal, September 26, 2009,

The investigation now moves from development of the method design to implementation of the designed methods for analysis. This section will discuss the study's demographics, qualifiers for inclusion and disqualifiers for exclusion for development of the study sample, all which compose Study Subject Characteristics. This discussion will follow:

- Study Subject Characteristics
- Phase III: Data Analysis–Descriptive Statistics
 - Predisposing Variables
 - Enabling Variables
 - Need Variables
- Phase III: Data Analysis–IPSW Application
- Phase III: Data Analysis–Multiple Linear Regression Results

Phase 1: Data Collection terminates with the application of the Domicile Adjustment to the Total Expenditures outcome variable upon setting of the maximum acceptable 'missing value' at 32 percent. Phase II: Data Preparation then began with the missing variable analysis. The analysis identified five variables with less than 32 percent missing variable values, and qualified those variables for imputation to complete the data. The missing value analysis reported another eight variables with great than 32 percent missing values, excluding those variables from the study²³. With the application of the maximum acceptable missing value percentage, this allowed for completion of co-variable selection.

The final step of Phase II: Data Preparation is the application of the imputation utilizing SAS version University Edition©2.4 multiple imputation function, moving the model to Phase III: Data Analysis.

4.01 Study Subject's Characteristics

Study subjects are actual Medicare Advantage beneficiaries who were dually eligible for Medicare and Medicaid. Additionally, they were also enrollees in Florida's Statewide Medicaid Managed Care (SMMC) - Long-Term Care (LTC) program. This population's primary source of insurance coverage was Part C Medicare - Medicare Advantage, with Medicaid acting as a supplemental or secondary coverage to Medicare Advantage. Medicaid²⁴ is the primary payer for

²³ With 47.13 percent missing values of co-variable Race within the LTC cohort, Race was excluded. This is further discussed in Chapter 5, Section 5.03 Data Limitations.

²⁴ Medicaid as a primary payer does not require secondary coverage. Medicaid is the 'payer of last resort'. Medicaid providers' agreements with the respective state or Managed Care Organization (MCO) require the provider to accept Medicaid reimbursement as payment in full; without the ability to balance bill the beneficiary.

eligible LTSS expenses in the form of supported self-care, which is not covered by Medicare (United States Department of Health and Human Services, 1985a, 1985b, 2012, 2014). Just as custodial nursing facility care is not a benefit covered by Medicare for LTC beneficiaries (United States Department of Health and Human Services, 1978), supported self-care in the home or community is also not covered by Medicare for HCBS beneficiaries (United States Department of Health and Human Services, 1985a).

4.01.a Residency

The study subjects' residency was either Broward or Miami-Dade counties²⁵. Medicaid requires state residency as part of eligibility determination. Florida's definition of residency is:

"Permanent residence" means that place where a person has his true, fixed, and permanent home and principal establishment to which, whenever absent, he has the intention of returning" Florida Administrative Code §196.012(17).

4.01.b Study Population – Qualifiers; Disqualifiers

4.01.b.i–Sample Qualifiers

The following are the qualifying criteria for inclusion in the study sample: One full month of MLTSS eligibility²⁶; ≥ 65 years of

²⁵ The total populations in these two counties represent approximately fifty percent of the State of Florida's total population. Similarly, the total Medicaid population in the same catchment areas reflects one-half of the total Medicaid population statewide (AHCA, 2012). Florida is the fourth largest Medicaid state, and the second largest population aged sixty-five and older (Mitchell et al., 2006). Additionally, Florida has the highest proportion of elders in its population (17 percent), as well as nearly twenty years of experience with pilot programs that provide managed long-term care services to elderly/frail populations (Mitchell et al., 2006).

²⁶ Erroneous beneficiary assignment to an MCO is a common occurrence. Many of these errors are corrected by the state within days to weeks of transmission of the 836-eligibility file from AHCA to the MCO contractor. For this study to ensure eligibility, retro-disenrollment was investigated for an additional six months from the last month of enrollment or the termination of the study, whichever was greatest.

age; A minimum of one paid Medicare or SMMC-LTC claim in either of the six claim categories, (e.g., ancillary, LTSS, pharmaceutical)²⁷; and, Coverage of both Medicare Part C, Medicare Advantage and SMMC-LTC by the same MCO contractor.

4.01.b.ii–Sample Disqualifiers

The following are the disqualifying criteria for exclusion in the study sample: Less than one month of MLTSS eligibility or retro-disenrollment up to six months after disenrollment or from last date of the study; < 65 years of age²⁸; Fee-For-Service Medicare Part A and Part B coverage; or, Another Managed Care Organization (MCO) coverage for Medicare Part C, Medicare Advantage or SMMC-LTC.

4.02 Phase III: Data Analysis-Descriptives

Of the thirteen variables, eleven had notable descriptive observations:

4.02.a Predisposing Variables

Sex–The thirty-eight percent difference between females and males demonstrates traditional increased longevity of females over males - refer to **Table 1**–Phase III; Data Analysis: Predisposing Variables–

²⁷ A small percentage of Medicaid beneficiaries that qualify for Medicaid through application for MLTSS refuse all MLTSS benefits. There is no requirement in CFR 42, Part 441, Sub-Part G that requires eligible MLTSS beneficiaries to receive MLTSS to maintain Medicaid eligibility. Any identified LTC or HCBS beneficiary with an eligible claim, whether MLTSS or medical, qualified the beneficiary for study inclusion.

²⁸ The age limit ensured that study was limited to elderly dual enrollees only. If a beneficiary qualified for MLTSS based on physical disability aged into qualification, they were neither disqualified nor removed.

Table 1-Phase III: Data Analysis-Predisposing Variables Descriptive Statistics

	LTC=0				HCBS=1			
	n-size	%	Mean	Std. Dev	n-size	%	Mean	Std. Dev
Sex (Imputed)								
Female (0)	420	0.65			625	0.73		
Male (1)	225	0.35			237	0.27		
<i>Total</i>	645	1.00			862	1.00		
Age								
			83.92	9.65			83.48	8.35
65-69 (0)	61	0.09			53	0.06		
70-79 (1)	137	0.21			219	0.25		
80-89 (2)	243	0.38			372	0.43		
90-99 (3)	176	0.27			202	0.23		
≥100 (4)	28	0.04			16	0.02		
<i>Total</i>	645	1.00			862	1.00		
Marital Status								
Married (0)	159	0.25			167	0.19		
Not Married (1)	212	0.33			249	0.29		
Widowed (2)	274	0.42			446	0.52		
<i>Total</i>	645	1.00			862	1.00		
AHCA Eligibility Waiver Codes								
MW A (0)	43	0.07			340	0.39		
MS (1)	43	0.07			447	0.52		
MH H (2)	90	0.14			8	0.01		
MI I (3)	329	0.51			23	0.03		
MH S (4)	17	0.03			0	0.00		
MI S (5)	73	0.11			7	0.01		
MM S (6)	8	0.01			5	0.01		
MI M (7)	1	0.00			0	0.00		
MA R (8)	0	0.00			1	0.00		
MH M (9)	1	0.00			0	0.00		
SIXT (10)	40	0.06			31	0.04		
<i>Total</i>	645	1.00			862	1.00		

Descriptive Statistics. Of note, 2014 U.S. Census report, “65+ in the United States: 2010” indicates that this gap is closing (West et al., 2014). Starting in 1980, demographers noticed the beginning of the closing of that gap, which has continued through the 2010 census (Martin & Preston, 1994; West et al., 2014). Considering the magnitude of the gap, and keeping all things equal at the current rate of closure, West et al. projects it will be generations before this gap significantly closes (West et al., 2014).

Another observation is the difference between the totals of female beneficiaries compared to males in both cohorts. There are greater than two females to every male beneficiary. Field experience and literature supports that male beneficiaries with evident functional deficits are more inclined to suffice with minimal to no provision of ADL and IADL assistance, and are more reticent to engage with supported self-care services. (Arber & Cooper, 1999; Orfila et al., 2006). As seen in acquiring health care, females more readily report functional deficits and decline, hence securing appropriate services to close those self-care gaps. Literature supports that women seek and successfully secure more services, and secure those services timelier, than do their male counterparts (Macintyre, Ford, & Hunt, 1999; Orfila et al., 2006), as males are reticent to seek care. Also, when men do seek and secure supported self-care services, they enter with greater service needs, utilizing more resources to stabilize self-care gaps to avoid institutionalization (Brossoie, Roberto, Willis-Walton, & Reynolds, 2011; Orfila et al., 2006).

A final observation on the sex variable is the equal distribution of males between the two cohorts, another noted difference between males and females. Whereas females in this sample reflect 27.86 percent selecting LTC versus 41.47 percent of women selecting HCBS, males show selection percentages per cohort 14.83 percent and 15.73 percent respectively, which is one percent difference.

Age—Whether alone or with other co-variates (in particular - sex or marital status), octogenarians and nonagenarians are at the apex of the Age bell curve. This too, is the distribution in the previously cited 2014 Census Bureau report, “*65+ in the United States: 2010*”, in which the percentages of octogenarians and nonagenarians are also the highest age groups (West et al., 2014). Findings in literature indicate these numbers have increased year over year since the 1980’s (Martin & Preston, 1994; West et al., 2014).

Novick et al. attributes thirty years increase in longevity on public health advances, through the decreases in infant mortality, better pre-natal care, childhood immunizations, preventive health care campaigns and hygiene (Novick, 2008). Whereas, West et al. credits the increases in octogenarians and nonagenarians to medical care advances in treatment and prevention for mortality decreases, hence increasing longevity (West et al., 2014). The Census Bureau report forecasts the next surge will be found in centenarians, as baby boomers increasingly age into LTSS (West et al., 2014).

Marital Status—The descriptive statistics of this category demonstrate widowhood as the leading marital status, which is a well-established trend, especially in oldest-old²⁹ populations. Again, referencing the 2014 Census Report “*65+ in the United States: 2010*”, which discusses that widowhood is decreasing on two fronts. The first

²⁹ Oldest-old are people who are eighty years old and older.

cause cited is divorce (West et al., 2014). As divorce became more socially acceptable, and the associated social stigmas of divorce commensurately faded (along with any accompanying social shunning and isolation), demographers report divorce increasing in older populations (Kertzer & Laslett, 1995; West et al., 2014). This change is being seen with the simultaneous increase in longevity (Kertzer & Laslett, 1995; Martin & Preston, 1994; West et al., 2014).

The second cited cause of widowhood reducing is more financial stability (Cummings & Galambos, 2004; West et al., 2014), especially in baby boomer women who entered the workforce in the nineteen sixties who are now retiring. They are retiring with their own pensions (Angel & Angel, 1997; Cummings & Galambos, 2004), providing them with more post-employment financial stability and therefore, greater life-style choices (Cummings & Galambos, 2004; Kertzer & Laslett, 1995).

Historically, knowing they would outlive their husbands, wives oftentimes would remain in marriages to keep financial resources intact until the husband's demise (Cummings & Galambos, 2004; Kertzer & Laslett, 1995). Now, with their own financial resources, they are no longer forced to wait (Angel & Angel, 1997).

Another finding in this variable's descriptive statistics is there is less than one percent difference between the two cohorts married variable value. There is a belief in the MLTSS industry that married people are far less frequently institutionalized, because they have a natural support in

their spouse to care for them. That is not what this sample reflects. Of course, greater study is required to substantiate this as a true empirical finding, as one sample does not suffice. Yet, it does call this belief into question.

AHCA Eligibility Waiver Code—The AHCA eligibility codes are assigned by Florida’s Department of Children and Families, and the state’s welfare agency denotes the source of the specific eligibility authority granting Medicaid benefit. Refer to Appendix C – AHCA Eligibility Codes and Descriptions for the comprehensive list of eligibility codes and the respective descriptions. This variable has three areas of comment.

MS and MW A are eligibility codes specific to HCBS beneficiaries. Hence, the large n-sizes in those categories demonstrate predominance of HCBS beneficiaries. This provided the investigation with confirmation of categorical assignment, to reduce the probability of type I errors. The same holds true for the principal LTC eligibility categories of MI I and MH H. MH H covers both institutional and community based hospices. Yet, in this sample’s LTC’s, hospice beneficiaries are twelve times greater when compared to the eight HCBS hospice beneficiaries.

Another observation is the differences between the case mix of the cohorts. The case mix in this population—43 percent for LTC beneficiaries compared to 57 percent for HCBS beneficiaries - is a relatively new phenomenon not seen until 2014, when Eiken reported for the first time Medicaid expenditures for HCBS exceeded LTC expenditures (S. Eiken et

al., 2014). Prior to the Olmstead Decision in 1999, the case mix was commonly reported in the mid to high ninety percent for LTC beneficiaries, and lower single-digit percentages for HCBS beneficiaries (Hurley et al., 1993; Madsen & Gillespie, 2014). The oldest program nationally is in Arizona, which has been operational since the nineteen eighties. Arizona Long Term Care System (ALTCS), has established the goal-standard case mix at 15 percent LTC and 85 percent HCBS (Burwell, 2001; Weissert et al., 1997).

Finally, there are instances in both cohorts where the eligibility codes are incongruent with the cohort assignment. This reflects a common lag in record updating when beneficiaries are either repatriating³⁰ back into the community or transitioning into a nursing facility. Their eligibility code changes with permanent domicile selection. There were no other notable findings within this variable. The discussion now moves to Enabling variables.

4.02.b Enabling Variables

Member Months—The large n-size/percentages of beneficiaries reflected in the 19-24 variable value demonstrates longevity of continuous enrollment not usually seen in this population - refer to **Table 2**—Phase III: Data Analysis: Enabling Variable – Descriptive Statistics. Historically,

³⁰ Repatriation is the common term used within the LTSS industry to denote a beneficiary residing greater than ninety days in a nursing facility who is returning to the community. Beneficiaries moving their permanent residence from the community to institutionalization into a nursing facility is commonly referred to as a transition. Beneficiaries whose primary residence is an Assisted Living Facility (ALF) are contractually designated to the HCBS cohort.

Table 2-Phase III: Data Analysis-Enabling Variables Descriptive Statistics

	LTC=0				HCBS =1			
	n-size	%	Mean	Std. Dev	n-size	%	Mean	Std. Dev
Member Months			19.00	7.61			21.58	4.79
1-6 (0)	77	0.12			4	0.00		
7-12 (1)	85	0.13			99	0.11		
13-16 (2)	23	0.04			38	0.04		
17-18 (3)	5	0.01			18	0.02		
19-24 (4)	455	0.71			703	0.82		
<i>Total</i>	645	1.00			862	1.00		
Medicare Coverage - Years			18.96	9.58			18.50	8.32
0 - 9 (0)	127	0.20			134	0.16		
10 - 19 (1)	189	0.29			309	0.36		
20 - 29 (2)	242	0.38			344	0.40		
30 - 39 (3)	81	0.13			73	0.08		
40 - 49 (4)	6	0.01			2	0.00		
<i>Total</i>	645	1.00			862	1.00		
Medicaid Coverage - Years			5.58	7.88			10.50	9.72
0 - 9 (0)	559	0.87			527.00	0.61		
10 - 19 (1)	37	0.06			169	0.20		
20 - 29 (2)	30	0.05			128	0.15		
30 - 39 (3)	13	0.02			28	0.03		
≥40 (4)	6	0.01			10	0.01		
<i>Total</i>	645	1.00			862.00	1.00		

Medicaid populations maintain seven continuous months of eligibility annually on average (AHCA, 2000), though this sample demonstrates eighty percent of LTC beneficiaries and ninety percent of HCBS beneficiaries having nineteen to twenty-four months continuous eligibility.

Years of Medicare Coverage—Other than reflecting congruency with the study sample’s Age variable, this variable is pedestrian for the population. The importance of this variable, like tenure in managed care, is that longevity with insurance coverage has a demonstrated direct relationship to reduced incurred costs (Halverson, Kaluzny, & McLaughlin, 1998; P. R. Kongstvedt, 2001; Shi & Singh, 2012). Better medical management and care coordination reduces costs by reductions of redundancy in diagnostic procedures, and better surveillance of

adherence to treatment and care plans, (i.e., medication management, physical therapy, home health nursing treatments, post-surgical wound care) (Davidson, 1998; P. R. Kongstvedt, 2009).

Years in Medicaid Coverage—The only notable observation for this variable are the large numbers in both cohorts within the zero through nine years variable values. This reflects the limited tenure of the program. Having started in October 2013, at the termination of the study period on June 30, 2016, the program was operational for two years and eight months.

4.02.c Need Variables

4.02.c.i—Categorical Variables

Risk Ranking

Supported Self-Care Continuum—These categorical

variables need to be discussed in tandem, as they are directly related. The variables' value assignment is initially automatically assigned by the care coordination/management IT application per contractual requirements, after the care coordinator/manager (CC/CM) completes the beneficiary's contractually required comprehensive needs assessment and prior to the development of the Plan of Care (POC). The CC/CM assigns the final risk ranking, providing written rationale to substantiate either increases or decreases in the ranking. The risk ranking is a global ranking, representing the overall risk for institutionalization. Refer to **Table**

3–Phase III: Data: Need Variables– Categorical Descriptive Statistics. In an initial review of the Need categorical variables,

Table 3-Phase III: Need Variables-Categorical-Descriptive Statistics

	LTC=0				HCBS =1			
	n-size	%	Mean	Std. Dev	n-size	%	Mean	Std. Dev
Risk Ranking (Imputed)								
High(0)	48	0.07			170	0.20		
Moderate (1)	71	0.11			678	0.79		
Low (2)	526	0.82			14	0.02		
<i>Total</i>	645	1.00			862	1.00		
Supported Self-Care Continuum- (Imputed)								
Independent/Verbal Reminding/ Prompting (0)	58	0.09			132	0.15		
Set-Up and Prompting (1)	102	0.16			266	0.31		
Assistance (2)	155	0.24			295	0.34		
Complete Care (3)	330	0.51			169	0.20		
<i>Total</i>	645	1.00			862	1.00		

there seems to be incongruence between the LTC beneficiary’s ranked risk and their assessment of need on a supported self-care continuum. Intuitively, as risk increases in a frail population, care needs would directly correspond, exhibiting greater supported self-care services. Inversely, as the risk decreases, so would the supported self-care needs. Yet, in these results it appears to be inverse – of 645 LTC members, 526 or 81.55% are risk ranked ‘Low’; yet, 75.19% of the supported self-care support is full assistance to complete care. This is a function of the definition of ‘risk’.

In LTSS, beneficiaries are ranked for their risk of being institutionalized into a nursing facility. Being that this cohort is ‘institutionalized’, there is low probability of being admitted into a

nursing facility, as they already reside there. Moreover, for LTC beneficiaries, risk is defined as being at risk for an ER Visit or acute care facility admission. The ‘rule-of-thumb’ for LTSS risk ranking of the ‘High’ variable value is no more than ten percent of the cohort. This sample is within that ‘rule-of-thumb’ at 7.44%.

The HCBS cohort is more exemplary of what is intuitive of risk to resource allocation. The balance of beneficiaries are ranked ‘Moderate’ in risk, and their commensurate services range from independent self-care to assistance.

As previously stated, there is a ‘rule-of-thumb’ that the risk ranking of the ‘High’ variable value should not exceed ten percent of the total respective cohort. In this sample, the highest acceptable amount would be 86 HCBS beneficiaries. Yet, at 170 HCBS beneficiaries, that is 19.72%, almost twice the acceptable ‘rule of thumb’ upper limit. Though unlike the LTC cohort, there is a direct relationship seen between the risk ranking and the supported self-care resource allocation, there are 170 beneficiaries ranked ‘High’ for risk of being institutionalized and commensurately, 169 assigned the highest level supported self-care – Complete Care.

4.02.c.ii–Continuous Variables

**Number of Emergency Room Visits
Number of Institutional-Acute Care Hospitalizations
Length of Stay (LOS)-Acute Care Hospitalizations
Number of Institutional-Other Hospitalizations**

Length of Stay (LOS)-Other Hospitalizations – The balance of these Need variables will be discussed collectively, as they are continuous variables and their results are similar - refer to **Table 4**–Phase III: Data Analysis - Need Continuous Variables – Descriptive Statistics. For each of the five variables, LTC group results demonstrate from 78-89% beneficiaries have zero ER visits or hospitalizations. For HCBS beneficiaries 75-89% have zero ER visits or hospitalizations. Further study is required to ascertain causation.

Managed care utilizes the Pareto Rule as a ‘rule of thumb’ for monitoring utilization. In this population, the LTC cohort demonstrates an average of 15.22% and the HCBS cohort demonstrates 16.42% of the populations are utilizers. Again, further investigation is necessary to ascertain causation of the less than 20% utilizers.

4.03 Phase III: Data Analysis–ISPW Application

As a review, of the function of the weighing in the form of Average Treatment of the Treated (ATT) analysis, in this investigation, the average expenditure on those study subjects that received LTSS that were in the HCBS cohort (the Treatment Group), as compared to the average expenditure of the LTC cohort (the Control Group).

Once the ATT analysis is completed, which weighs the variables, the investigation is ready to move to the final processes of the linear regression

Table 4-Phase III: Data Analysis-Need Variables-Continuous-Descriptive Statistics

	LTC=0				HCBS =1			
	n-size	%	Mean	Std. Dev	n-size	%	Mean	Std. Dev
Number of Emergency Room Visits								
0 (0)	572	0.89			650	0.75		
1 (1)	49	0.08			121	0.14		
2 (2)	15	0.02			42	0.05		
3 (3)	4	0.01			28	0.03		
4 (4)	1	0.00			7	0.01		
5 (5)	3	0.00			10	0.01		
6 (6)	0	0.00			4	0.00		
7 (7)	1	0.00			0	0.00		
<i>Total</i>	645	1.00			862	1.00		
Number of Intititionalizations-Acute								
0 (0)	576	0.89			709	0.82		
1 (1)	33	0.05			70	0.08		
2 (2)	17	0.03			27	0.03		
3 (3)	8	0.01			22	0.03		
4 (4)	3	0.00			12	0.01		
5 (5)	3	0.00			10	0.01		
6 (6)	1	0.00			12	0.01		
7 (7)	1	0.00			0	0.00		
8 (8)	3	0.00			0	0.00		
<i>Total</i>	645	1.00			862	1.00		
Length of Stay-Acute Institutionalization								
0 (0)	576	0.89			709	0.82		
1-5 (1)	32	0.05			67	0.08		
6-10 (2)	17	0.03			40	0.05		
11-15 (3)	4	0.01			20	0.02		
16-20 (4)	3	0.00			10	0.01		
21-25 (5)	2	0.00			4	0.00		
26-30 (6)	3	0.00			3	0.00		
31-35 (7)	2	0.00			1	0.00		
36-40 (8)	2	0.00			4	0.00		
41-50 (9)	3	0.00			1	0.00		
>50 (10)	1	0.00			3	0.00		
<i>Total</i>	645	1.00			862	1.00		
Number of Intititionalizations-Other								
0 (0)	505	0.78			767	0.89		
1 (1)	102	0.16			63	0.07		
2 (2)	28	0.04			16	0.02		
3 (3)	4	0.01			11	0.01		
4 (4)	4	0.01			3	0.00		
5 (5)	1	0.00			0	0.00		
6 (6)	0	0.00			2	0.00		
7 (7)	1	0.00			0	0.00		
<i>Total</i>	645	1.00			862	1.00		
Length of Stay-Other Institutionalization								
0 (0)	505	0.78			767	0.89		
1-5 (1)	7	0.01			10	0.01		
6-10 (2)	25	0.04			17	0.02		
11-15 (3)	27	0.04			16	0.02		
16-20 (4)	16	0.02			11	0.01		
21-25 (5)	12	0.02			7	0.01		
26-30 (6)	10	0.02			8	0.01		
31-35 (7)	12	0.02			3	0.00		
36-40 (8)	4	0.01			4	0.00		
41-50 (9)	5	0.01			6	0.01		
51-60 (10)	8	0.01			4	0.00		
61-100 (11)	8	0.01			7	0.01		
>50 (12)	6	0.01			2	0.00		
<i>Total</i>	645	1.00			862	1.00		

construction, and then the running of the regression model. The actual weighting is a function, applied during the running to the actual regression. It does not provide an output like the descriptives or the regression that permits presenting in a table for comment and discussion. Therefore, the actual effect of the IPSW will be discussed later in 4.04 - Multiple Linear Regression section. Yet, the discussion first progresses to identification of a challenge that presented during method preparation of the IPSW.

As part of preparation of the application of the IPSW, it is suggested that the data be reviewed to ensure that there is a wide enough distribution of the co-variables to ensure a robust sample upon which to run the weighting. Figure 1–

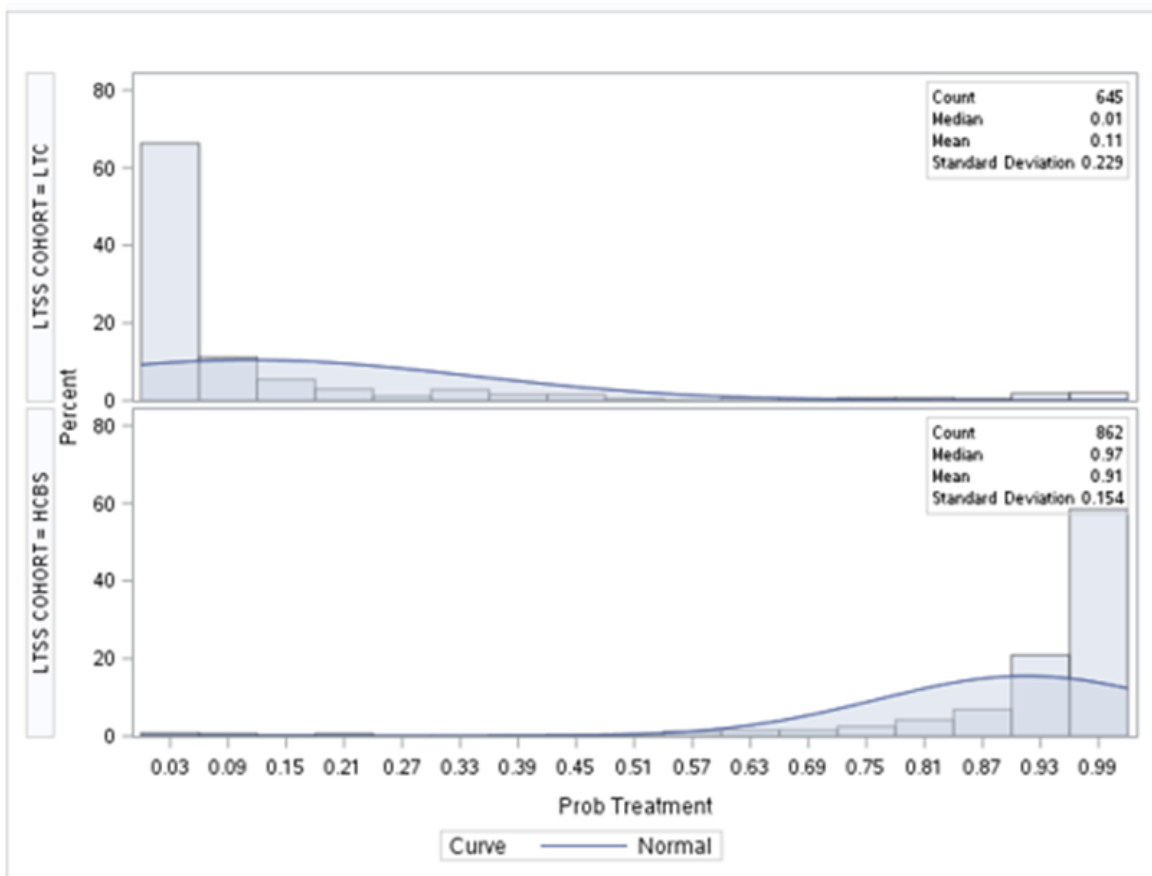


Figure 1-Post Imputation-Pre-Inverted Propensity Score Weighting by Cohort Histogram

Post Imputation–Pre-Inverted Propensity Score Weighting by Cohort Histogram illustrate the initial histogram with all predictors in the IPSW model. It clearly demonstrates the LTC Cohort and HCBS Cohort closely correlating with its respective probabilities of treatment of 0 and 1. The benefit of this initial distribution is that it provides assurances that those who are categorized LTC or HCBS are truly in the cohort. The challenge in this distribution is the schism between cohorts preventing a wider distribution upon which the weighting would be drawn. The solution was found to be relatively simple. With the removal of both the Risk Ranking (Need_Risk_Ranking) and AHCA Eligibility Waiver Code (Pre_Waiver) variables as predictors in the propensity model, as demonstrated in

Figure 2-Post Imputation–Pre-Inverted Propensity Score

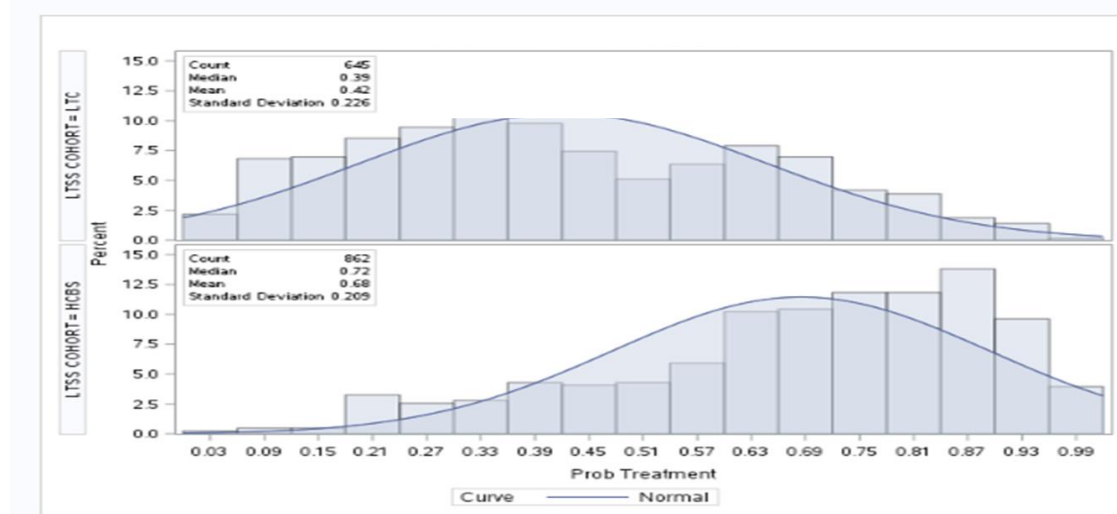


Figure 2-Post Imputation-Pre-Inverted Propensity Score Weighting by Cohort Excluding Risk Ranking and AHCA Eligibility Waiver Codes Histogram

Weighting by Cohort Excluding Risk Ranking and ACHA Eligibility Waiver Codes Histogram, a wider distribution of treatment probabilities is demonstrated, hence increasing the pool of variables for inclusion in the weighting. This greatly enhances the weighting, therefore drawing a more robust weighting.

4.04 Regression Results

As a standard process to secure a sense of perspective to the final results of the regression, first is a review of the unadjusted mean of the outcome variable—Total Expenditure. Please see **Table 5—Unadjusted Mean LTSS**

Table 5—Unadjusted Mean LTSS Cohorts: Total Expenditures

TOTAL - Total Expenditure: 55,854,503.66
 TOTAL - Total Expenditure – DA: 47,179,694.66

LTSS Cohort	Variable	Mean	Std. Dev	Minimum	Median	Maximum
LTC	Total Expenditure N=645	49,613.32	38,145.77	62.34	52,378.91	283,285.22
LTC	Total Expenditure – DA N=645	36,164.00	33,040.92	-8014.39	33,186.60	273,286.22
HCBS	Total Expenditure N=862	27,672.75	30,440.32	122.74	19,945.93	345,751.33

* Please note that moving forward the LTSS Cohort – LTC, will demonstrate two results, those of unadjusted values and those that had a Domicile Adjustment applied to amend for the room and board incurred-costs that are not a benefit for HCBS beneficiaries. Additionally, throughout the presentation tables representing Per Member Per Month (PMPM) are also being offered for the convenience of the reading audience. As many MCO executives only think in terms of PMPM over Total Expenditures.

Cohorts: Total Expenditure and for convenience **Table 6—Unadjusted Mean**

LTSS Cohorts: PMPM Expenditure:

Table 6-Unadjusted Mean LTSS Cohorts: PMPM Expenditures

TOTAL - PMPM Expenditure: 2,916,065.01
 TOTAL - PMPM Expenditure – DA: 2,474,804.01

LTSS Cohort	Variable	Mean	Std. Dev	Minimum	Median	Maximum
LTC	PMPM Expenditure N=645	2,763.59	3,108.11	5.82	2,503.86	51,867.91
LTC	PMPM Expenditure – DA N=645	2,079.46	3,012.72	-764.07	1,672.86	51,363.91
HCBS	PMPM Expenditure N=862	1,315.02	1,340.84	6.82	969.60	14,406.31

* Please note that moving forward the LTSS Cohort – LTC, will demonstrate two results, those of unadjusted values and those that had a Domicile Adjustment applied to amend for the room and board incurred-costs that are not a benefit for HCBS beneficiaries. Additionally, throughout the presentation tables representing Per Member Per Month (PMPM) are also being offered for the convenience of the reading audience. As many MCO executives only think in terms of PMPM over Total Expenditures.

These results demonstrate for the LTC cohort’s (control group) Total Expenditures reflecting a mean of 49,613.32, with a standard deviation at 38,145.77. The minimum expenditure is 62.34. The next value up is 99.98, and then the values increase to three digits. The maximum expenditure of 283,285.22 reflects a LTC beneficiary’s expenditures, with a PMPM of 51,867.91 for four months, which was end-of-life care.

The only remarkable amount for the LTC Total Expenditures Domicile Adjustment (DA) is found in the Minimum variable value of -8,014.39, which was caused as a function of applying the DA. There were four other beneficiaries whose minimum values were reduced into negative values by application of the adjustment attempting to control for ‘room and board’ as a covered benefit for only LTC beneficiaries. For truth in reporting and data integrity, the adjustment had to be equally applied to all beneficiaries irrespective of the outcome.

Finally, for Total Expenditures, the treatment group - HCBS cohort's unadjusted mean is 27,672.75, with a standard deviation of 30,440.32. The cohort's maximum expenditure is 345,751.33, which is a 14,406.31 PMPM. This beneficiary was in the program for the full two years of the study.

It is easy to see how quickly an assumption can be made that HCBS expenditures rival LTC's expenditures. When there is a comparison between the two cohorts, LTC to HCBS or LTC with DA to HCBS, on the raw data without controlling for independent variables, simple arithmetic readily confirms where claims could be made that HCBS expenditures are less than those of LTC and LTC with DA.

Also presented for convenience is **Table 6**—Unadjusted Mean LTSS Cohorts: PMPM Expenditure, as a weighted, unit of comparison between the two cohorts. Also, PMPM is a commonly used unit of perspective in the MCO industry.

These results demonstrate for the LTC cohort's (control group) PMPM Expenditures of 2,763.59 with a standard deviation at 3,108.11. The minimum pmpm is 5.82. The maximum pmpm is 51,867.91, which is the previously discussed beneficiary with end-of-live expenditures for approximately four months.

As in the previous section on Total Expenditures, the only remarkable result for the LTC cohort in the PMPM Expenditure—Domicile Adjustment (DA) is found in the Minimum variable. The value of -764.07 demonstrates the previously discussed effect caused by the application the Domicile Adjustment.

Finally, the treatment group - HCBS cohort's unadjusted PMPM mean is 1,315.02, with a standard deviation of 1,340.84. The cohort's maximum PMPM was 14,406.31. As previously discussed, this beneficiary was in the program for the full two years of the study. To follow are sub-sections 4.04a and 4.04b, completing the data analysis with discussion of the weighted and unweighted regressions respectively.

4.04.a Multiple Linear Regression-Weighted Results

To start this discussion, it begins with the regression equation of:

$$Y_i = \alpha + \beta HCBS_i + \Gamma X_i + \epsilon_i$$

with the co-variables of:

1. Predisposing—sex, age, marital status, AHCA eligibility waiver code;
2. Enabling—member months, years in Medicare and years in Medicaid; and,
3. Need – risk ranking, supported self-care continuum placement, number of ER visits, number of acute care hospitalizations, length of stay for acute hospitalizations, number of other care hospitalizations and length of stay for other hospitalizations.

Refer to **Table 7**—Multiple Linear Regression with IPSW. The HCBS cohort's value is -14,565.03; reflecting \$14,565.03 less expenditures for HCBS beneficiaries when compared against the expenditures of the control group - the LTC beneficiaries' expenditures. Being that the 95 percent Confidence Interval (CI) excludes zero and has a p-value of <.0001, there is evidence of a strong relationship between total expenditures and the cohort variables. Conversely, the Total Expenditure—Domicile Adjusted with a

Table 7-Multiple Linear Regression with IPSW

TOTAL - Total Expenditure: 55,854,503.66 TOTAL - PMPM Expenditure: 2,916,065.01
 TOTAL - Total Expenditure – DA: 47,179,694.66 TOTAL - PMPM Expenditure – DA: 2,474,804.01

Outcome Variable	Linear Regression	HCBS	(95% CI)	p-value
Total Expenditure	Weighted (n=1,507)	-14,565.03 3,091.68 (Std. Error)	(-20,629.58 – -8,500.48)	<.0001
	Weighted DA (n=1,507)	-1,657.12 2,963.66 (Std. Error)	(-7,470.55 – 4,156.31)	0.5761
PMPM Expenditure	Weighted (n=1,507)	-802.76 176.14 (Std. Error)	(-1,148.27 – -457.25)	<.0001
	Weighted DA (n=1,507)	-145.37 170.71 (Std. Error)	(-480.244798 – 189.492332)	0.3946

* Please note that moving forward the LTSS Cohort – LTC, will demonstrate two results, those of unadjusted values and those that had a Domicile Adjustment applied to amend for the room and board incurred-costs that are not a benefit for HCBS beneficiaries. Additionally, throughout the presentation tables representing Per Member Per Month (PMPM) are also being offered for the convenience of the reading audience. As many MCO executives only think in terms of PMPM over Total Expenditures.

HCBS result of -1,657.12 does not show a direct relationship with the outcome variable, as the CI includes zero and the p-value is outside of the range of rejection with a value of 0.5761.

Finally, as discussed previously, the PMPM expenditures confirm the Total Expenditure results in that the HCBS cohort’s PMPM -802.76; reflecting \$802.76 less PMPM of incurred costs for HCBS beneficiaries when compared against the PMPM expenditures of the control group - the LTC beneficiaries’ expenditures. Being that it excludes zero from the 95 percent Confidence Interval (CI) and has a p-value of <.0001, there is strong evidence of a relationship between total expenditures as the outcome variable with the cohort variables. Moving to the un-weighted

regression results will culminate the regression results discussion, and now allows for discussion of the IPSW effect.

4.04.b Multiple Linear Regression–Un-Weighted Results

Please refer to **Table 8**–Multiple Linear Regression without Weighting. The HCBS cohort’s value is -14,049.65; reflecting \$14,049.65 less incurred costs for HCBS beneficiaries when compared against the expenditures of the control group - the LTC beneficiaries’ expenditures.

Table 8–Multiple Linear Regression without Weighting

TOTAL - Total Expenditure: 55,854,503.66 TOTAL - PMPM Expenditure: 2,916,065.01
 TOTAL - Total Expenditure – DA: 47,179,694.66 TOTAL - PMPM Expenditure – DA: 2,474,804.01

Outcome Variable	Linear Regression	HCBS	(95% CI)	p-value
Total Expenditure	Un-Weighted (n=1,507)	-14,049.65 2,764.89 (Std. Error)	(-19,473.18 – -8,626.12)	<.0001
	Un-Weighted DA (n=1,507)	-3,070.26 2,593.49 (Std. Error)	(-8,157.58 – 2,017.07)	0.2367
PMPM Expenditure	Un-Weighted (n=1,507)	-1,212.40 217.60 (Std. Error)	(-1,639.24 – -785.56)	<.0001
	Un-Weighted DA (n=1,507)	-575.35 211.13 (Std. Error)	(-989.49 – -161.21)	0.0065

* Please note that moving forward the LTSS Cohort – LTC, will demonstrate two results, those of unadjusted values and those that had a Domicile Adjustment applied to amend for the room and board incurred-costs that are not a benefit for HCBS beneficiaries. Additionally, throughout the presentation tables representing Per Member Per Month (PMPM) are also being offered for the convenience of the reading audience. As many MCO executives only think in terms of PMPM over Total Expenditures.

Being that the 95 percent Confidence Interval (CI) excludes zero and has a p-value of <.0001, there is strong evidence that there is a relationship between total expenditures as the outcome variable with the cohort variable.

Conversely, the Total Expenditure – Domicile Adjusted with a HCBS result of -3,070.26 does not show evidence of a relationship between the outcome variable and the cohort variable, as the CI, includes zero.

Finally, as discussed previously, the PMPM expenditures confirm the Total Expenditure results in that the HCBS cohort's PMPM -1,212.40; reflecting \$1,212.40 less PMPM of incurred costs for HCBS beneficiaries when compared against the PMPM expenditures of the control group - the LTC beneficiaries' expenditures. Being that it excludes zero from the 95 percent Confidence Interval (CI) and has a p-value of <.0001, there is a strong relationship between total expenditures as the outcome variable with the cohort variable. This completes the analysis and results portion of the study, moving the study to Chapter 5-Discussion and Conclusion.

CHAPTER V

5.0 DISCUSSION and CONCLUSION

*“Let no man think that sudden in a minute
All is accomplished and the work is done –
Though with thine earliest dawn thus shouldst begin it
Scarce were it ended in thy setting sun.”*

*F.W.H. Myers, August 5, 1916
(Excerpt from poem “Saint Paul”)*

This chapter presents the relevance of the study to current literature, limitations found during the study, major findings compared to the study’s objectives and aims from the data presented in Chapter 4. It provides a discussion of the implication for action, and recommendations for further research. The discussion will follow:

- Relevance and findings related to the literature
- Major findings compared to the study’s objectives and aims
- Study limitations
- Implication for action; and,
- Conclusions

5.01 Study Relevance and Objectives

5.01.a Relevance

The relevance of this study, as compared to current literature, is three-fold:

1. *Composition of expenditure categories*—Eleven of the other studies compared only LTC costs directly to only HCBS costs, with no

consideration of other health and wellness incurred-costs. The twelfth, Broyles in 2014, compared differences in primary insurer (Medicare only) expenditures between the two cohorts, whereas this study measured incurred costs from both primary (Medicare and Medicaid) and secondary (Medicaid) expenditures across seven categories:

- (1) Ancillary;
- (2) Institutional–Acute;
- (3) Institutional–Other;
- (4) LTSS;
- (5) Miscellaneous;
- (6) Pharmaceutical; and,
- (7) Professional.

2. *Managed care programs*—In Florida, prior to the SMMC-LTC program, services were care coordinated/managed and provided by local or state-run programs. The differences in these two programs are multi-dimensional and too numerous to discuss here. McLaughlin’s performance criteria have very different ordering, as previously discussed. Important to this study are differences in reimbursement methodologies. Nine of ten previous studies were FFS only. Only one study of Arizona’s LTSS programs was MLTSS, which started in the 1980’s in the managed care milieu. This study was in the managed care milieu with reimbursement methodologies including capitated payment schedules, FFS and risk agreements; and,

3. *Application of a Domicile Adjustment*—In an attempt to adjust for Medicaid’s ‘room and board’ benefit differences between the two cohorts’, a domicile adjustment of -\$831.00 was developed and applied to each month of enrollment for each LTC beneficiary. This adjustment was derived from the United States Housing and Urban Development (USHUD) affordable housing rental fees for Miami-Dade and Broward counties.

In the previous discussed studies in the literature review, only one attempted to weight the LTC beneficiaries’ LTSS expenditures to adjust out the ‘room and board’ expenditure differences between the two cohorts. The LTC cohort’s total expenditures include ‘room and board’, whereas HCBS total expenditures do not include ‘room and board’ incurred-costs. This is an ever-present, unreconciled difference in total costs in the other studies. An unintended consequence occurred with this adjustment, causing a study limitation effecting only four of the 645 LTC cohort’s beneficiaries. The limitation caused by this adjustment evinced negative total expenditures caused by the application of the domicile adjustment or 0.6202%.

5.01.b Major Findings

Through multiple linear regression with IPSW, the HCBS cohort’s value is -14,565.03; reflecting \$14,565.03 less expenditures for HCBS beneficiaries when compared against the expenditures of the control group—the LTC beneficiaries’ expenditures. Being that it excludes zero from the 95 percent Confidence Interval (CI) and has a p-value of <.0001,

there is strong evidence of a relationship between total expenditures as the outcome variable with the cohort variable.

The overall objective of this research was to determine, at an individual level, if those beneficiaries electing LTC have greater total health care and LTSS expenditures as compared to their HCBS counterparts. The first aim, is to determine, at an individual level, if the Total Expenditures, whether presented as total expenditure or Per Member Per Month (PMPM) total health care expenditures, are equal. With the HCBS's cohort evincing less total expenditures, the null hypothesis was rejected. Whereas the alternative hypothesis was accepted.

The primary hypothesis: H_0 – Total Expenditures for HCBS beneficiaries are no different from Total Expenditures for LTC beneficiaries, was rejected because this study showed they were different, in that the HCBS (experimental group) evinced 14,565.03 less total expenditures compared to the control. H_A – Total Expenditures for HCBS beneficiaries are higher than Total Expenditures for LTC beneficiaries. Contrary to the literature, which repeatedly evinced higher expenditures for HCBS beneficiaries, this study showed that HCBS expenditures were 14,565.03 less than the LTC (control) cohort.

The second aim is to determine if an application of a Domicile Adjustment to the LTC beneficiaries only would normalize the differences (if present) in Total Expenditures, caused by a 'room and board' benefit

difference between the cohorts. The secondary hypothesis is: H_0 – Total Expenditures for HCBS beneficiaries are no different from Total Domicile Adjusted Expenditures for LTC beneficiaries. Although in both the weighted and unweighted there was a negative difference showing HCBS expenditures were less than the control's, the results were a statistically insignificant difference. H_A – Total Expenditures for HCBS beneficiaries are higher than Total Domicile Adjusted Expenditures for LTC beneficiaries. Again, this too was accepted, because the result was negative, evincing HCBS expenditures being less.

5.02 Limitations

All studies suffer from limitations, as perfect information is not a reality. In this relatively small study, there are seven different limitations, presented here in no particular order. The first, the application of the domicile adjustment's negative effect on four of the beneficiaries in the LTC cohort, was discussed above in 5.01.a.

The second was the high percentage of missing variable values, a common occurrence in Medicaid data. This is a peril confronted when using real data from actual beneficiaries. Although there were multiple sources exploited to obtain the data, (e.g., claims data, administrative files, enrollment data) in many circumstances, especially for the LTC beneficiaries, it would have required a chart audit at the actual nursing facility to obtain all the missing data. This is the third limitation, as researchers are often challenged by competing priorities of limited resources and study integrity. There was no funding available to conduct

onsite visits. This is where practicality and return on investment must be reconciled. With Rubin and Rosenbaum's due diligence in the 1980s, they gifted today's social science researchers with the development of a valuable statistical method that facilitates reconciliation between zero resources and high data integrity.

Imputation opened avenues, which allow researchers to complete their study's data sets through highly accepted statistical methods (Schafer, 1999; Schafer & Graham, 2002). Another benefit afforded to researchers is that it is no longer necessary to have to choose between dealing with bias caused by missing data versus compromising sample size due to disqualification for missing data. Hence, for this study it was decided to impute missing variable values to complete the study's data set.

The fourth limitation was the exclusion of *Race*, which was a self-inflicted limitation. It truly exhibited the novice researcher's naiveté and lack of research experience. *Race* was excluded from this study, as it was determined during the development of the study methods in Chapter 3, that missing variable values greater than 32% would be disqualified from imputation. The *Race* variable evinced 47.13% missing variable values, excluding the variable from the study.

There was literature that was discovered after the running of the regression, by Schafer and Rubin, which offered that imputation could be applied to missing values as high as 50%. Attempting to protect validity and relevance, the disqualifying percentage was calculated too conservatively. The 30% missing value constraint is a 'rule-of-thumb' for imputation, not a theoretical construct that

required rigid adherence. The acceptable percentage simply should have been extended to 47.2, which would have included Race. However, it would have required additional considerations, as there were another four variables that also fell between 32% and 41.2%. Those four variables could have had fatal, adverse effects that would still have called for exclusion. This was a costly, yet valuable, lesson learned by the investigator for future research.

In this discussion of imputation, a fifth limitation must be announced. Though for this level of study, it is considered a 'soft limitation', it is still a limitation—imputation error. Any time data is imputed with even the most acceptable method(s), prediction error enters with any manipulation. Imputation error impacts the variability of variables' values, irrespective that the imputation method in this study was SAS University Edition© Multiple Imputation, a highly recognized and accepted multiple imputation method. The results should have been re-evaluated for the impact of imputation error; it was not. As variability of the imputed values is increased, so to would the width of the Confidence Interval (CI). To better ensure the integrity of the CI range and potentially widen the range, the impact of the imputation error should be determined and controlled for through advanced statistical methods.

Reminiscent of Antonio Salieri's critique of Mozart's, *Le nozze di Figaro* (The Marriage of Figaro), Salieri, the Austrian royal court's maestro in the late 1700s, offered that Mozart's opera had 'too many notes' (Shaffer, 1984), to which Mozart rhetorically asked, which of the notes were the offenders (Shaffer, 1984)?

Surprisingly, propensity score methods are intolerant of too many variables, and more than three variable's values per value—the sixth limitation.

With today's sophisticated statistical methods, statistical software and micro computing power, 'too much' of anything seems improbable, yet these are limits for propensity scoring methods. The number of variables for this study were not limiting, as the conservative missing variable value percentage of 32% controlled that potential problem. This limitation emerged from the number of categorical variable values per each variable.

In some instances, there were up to eleven variable values. All those variables with greater than three values had to be recoded to three values. An example of recoding to reduce variable values is Marital Status (Pre_Mar_Stat). Marital Status originally had six categories: Married, Partnered, Single, Separated, Divorced and Widowed. It was reduced to three: Married, which included Married, Partnered and Separated; Not Married, which included Single and Divorced; and a third Marital Status—Widowed.

Finally, the seventh limitation should be categorized as an organizational change limitation. Due to a corporate re-organization, the investigator lost access to certain data, based on Personal Health Information (PHI) requirements of only those who have a 'need to know' in the performance of their employment can access a beneficiary's PHI. The inability to cross check between multiple differing data sources restricted the investigator's ability to ascertain possible rationales of questionable findings, an example of this being the largest total expenditure for \$354,751.33.

The beneficiary was with the program for the full twenty-four months of the study. Their PMPM of \$14,406.31 was just shy of ten times the cohorts mean. The inability to look at line item claims data and accounting data due to the loss of PHI prohibited the ability to ascertain if the expenditure was end-of-life care or inordinately expensive chronic care.

5.03 Findings Related to the Literature

Not since the 1970s has a cost comparison study of elderly Medicare duals demonstrated the HCBS cohort expenditures being less than the LTC cohort, until this study. Starting in 1970 with the first HCFA³¹, Brandis University, Temple University and Mathematic study, what was then called Long-Term Care was merely a developing construct of a proposed alternative to institutionalization. HCFA's modeling of this new concept in elder care showed sizeable savings in the home care models as compared to institutional expenditures. Yet, all these constructs of institutional alternatives were only hypothetical models necessary for the development of new theory paradigms.

From the study as a product of the 1980 National Long Term Care Demonstration Project, funded by Robert Wood Johnson through the 2011 Harrington et al. study, all have evinced LTC as less costly than HCBS, so initially the results were surprising.

Clearly, the result of -14,565.02³² being less than the control evinces that, of those beneficiaries in the HCBS cohort, their estimated costs for the two years

³¹ Health Care Financing Administration, the predecessor to Center for Medicare and Medicaid Services (CMS).

³² Inverted Propensity Score Weighting was applied as part of the regression, and demonstrates only a four percent difference between the results of the weighted and un-weighted regressions. Therefore, only the weighted regression will be included in this discussion.

of the study were less than the LTC control group when coupled with the $<.0001$ p-value, demonstrating a statistically significant result. Whether looking at the results from a total expenditure or through the PMPM, the results are the same. The weighted PMPM reported as -802.76 , with a p-value of $<.0001$, also showing that the HCBS cohort's estimated incurred-costs as less than the control cohort.

As mandated by scientific methods, the null hypothesis must be rejected with these results, but there are other considerations when discussing the results against peer-reviewed publications. There are concerns voiced in the literature over statistical significance versus clinical significance (Jacobson & Truax, 1991; Johnson, 1999). This is one of those circumstances when the results most certainly demonstrate statistical significance, but when compared to total expenditures of $\$55,854,503.66$, the HCBS cohort's two-year weighted estimate incurred-costs are -0.02608% of the total expenditures.

For context and by industry standards, these savings are equivalent to three-weeks of executive travel expenditures. So, when taken into context of a multi-billion-dollar corporation, these savings are insignificant. Furthermore, there were no administrative expenditures charged against these results. A few examples of MCO's expenditures (direct or shared) that were not considered in these calculations are:

- *Direct administrative expenditures*—There are direct incurred-costs for claim adjudication and payment, issuance of authorizations, care coordination/management, etc., as it directly relates to the

beneficiaries covered in the line-of-business that are not a consideration of this study; and,

- *Shared administrative expenditures*—Each line-of-business is charged a percentage of its receivables to covered shared expenditures, as each line-of-business covered by the MCO does not have its own legal, human resource, payroll, benefit administration, etc. departments. Hence, there is a percentage of the receivables that will be charged to the SMMC-LTC line-of-business to cover their usage of those corporate shared services. These too were not considered in this study.

As they were administrative expenditures that were not part of the study, they cannot be considered in the rejection of the null hypothesis. Scientific methods do not take any extenuating circumstances into consideration when drawing an investigation's conclusion.

5.04 Conclusions

5.04.a Implication for Action

From a global perspective, Dr. Weissert recognized that valuable and scarce research resources were being expended to all the same empirical conclusions (Weissert, 1985; Weissert et al., 1988). So, he availed that the research topics would change from cost-comparison to cost-saving opportunities. Olmstead gave the field the greatest motivation to shift the research to find ways to overcome home and community based service costs challenges. Literature is replete with evidence that being allowed to age-in-place, within one's community and home, is the most

desirous choice (J. Guo, Konetzka, Magett, et al., 2015; Wolff, Kasper, & Shore, 2008). Researchers need to work diligently in the next five years to make home and community incurred-costs more economical. Research topics could include:

- How long does it take to appreciate the return on investment when repatriating someone back to the community?
- Is there recidivism back to the facility? If so, are there at risk groups, (i.e., length of institutionalization, age, sex)?
- Is there a length of institutionalization that disqualifies someone from repatriation considerations?
- What special planning, services, increase initial supports ensure permanent repatriation?
- What are reasonable and customary repatriation costs, (i.e., utility deposits, housing deposits, furnishing replacement, environmental access modification)?
- Are community based residential alternatives, (i.e., adult foster homes, adult room-mating, home sharing) more beneficial for the residents?
- What are the total incurred-cost comparisons between self/consumer/participant directed care and formal caregivers?

At a more granular level specific to this study, there are two additional considerations that if retested may cause changes in the outcomes. The first is the domicile adjustment, the formulation methodology, could use additional considerations, specific to actual zip codes to more accurately represent market values of affordable housing expenditure. The USHUD's affordable housing rents are an average for the county. What is unknown now, does the sample live in higher rental

areas than the average or less? If the rent had been \$20.00 more per month the results would have reflected more expenditures for the HCBS cohort, so was the rent less reflective of reality?

The second consideration, is the exclusion of administrative expenditures. Whereas, this study did include all health and wellness expenditures for the beneficiaries from all payer sources, it did not include administrative expenditures. There is a ratio of the beneficiary's premium that limits premium usage by the MCO. In the SMMC-LTC program the ratio is 85% to 15%. Eighty-five percent of the premium must be expended toward MLTSS benefits on behalf of the beneficiary.

The remaining fifteen percent is allocated for administrative expenditures bore by the MCO, (i.e., human and capital expenditures for claims adjudication, care coordination/management services, issuance of prior authorizations, claim error resolution, provider relations). These expenditures were not a consideration in this study and should be included in future research

5.05.b Concluding Remarks

This work opens an arena of work that could take a lifetime of scholarship. Excluding the work from the original HCFA model study (Applebaum et al., 1988; Carcagno & Kemper, 1988), there was only one other study thus far to show savings for the HCBS cohort. That was Weissert's study in 1997 in which he conducted estimation analysis on the Arizona MLTSS program which is the oldest program MLTSS program in

the US. In that study, he evinced 4.6 million in savings, which is the largest and only MLTSS study published to date.

Although this study pales in comparison from the size of that study and magnitude of savings, none the less it demonstrated savings. It also calls for further studies on the same cohort to definitively demonstrate savings and the amount saved. As discussed above there are some additional administrative expenditures that should be considered. Additionally, there could be additional refinements to the domicile adjustment that could shift and enhance the study's outcomes. There are numerous tweaks, additions and changes that could be modified and added to this study, as it has been pondered over the passing eighteen months, proving that academia does not stop at the close of this dissertation, but provides the opportunity to ask yet better questions going forward.

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APPENDIX A
GLOSSARY OF TERMS/ACRONYMS

ADA – American’s with Disabilities Act: A law that was enacted by the U.S. Congress in 1990. In 1986, the National Council on Disability had recommended enactment of an Americans with Disabilities Act (ADA) and drafted the first version of the bill which was introduced in the House and Senate in 1988. The law gives civil rights protections to individuals with disabilities similar to those provided to individuals on the basis of race, color, sex, national origin, age, and religion. It guarantees equal opportunity for individuals with disabilities in public accommodations, employment, transportation, State and local government services, and telecommunications.

ADL – Activities of Daily Living: The basic activities necessary for a person to perform daily are bathing, dressing, toileting, transferring, continence control and eating.

AHCA – Agency for Health Care Administration: The state of Florida’s Medicaid agency.

ALF – Assisted Living Facility: A residence for adults with physical disabilities or functional deficits who cannot or chose not to live independently.

CC/CM – Care Coordinator/Care manager: The former is a paraprofessional, (e.g., certified nursing assistant, social worker, licensed practical nurse, etc.) who is assigned to the beneficiary to conduct initial and annual needs assessment, develop the beneficiary’s PLOC and coordinate service delivery. The latter is a professional, registered nurse who is assigned to the beneficiary to conduct initial and annual needs assessment, develop the beneficiary’s PLOC, coordinate service delivery, conduct annual and prn medication reviews and interact with the beneficiary’s primary care provider (PCP) for care coordination.

CFR – Code of Federal Regulations: All federal government entities’ rules and regulations for operations, scope of work and legislative authority.

CI – Confidence Interval: A range of values (interval) that act as good estimates of the unknown population parameter.

CMS – Centers for Medicare and Medicaid Services: The federal agency that runs the Medicare program. The federal agency is also responsible for collaborating the States to run the Medicaid program. The agency works to make sure that the beneficiaries in these programs are able to get high quality health care. CMS is the successor of the Health Care Finance Administration (HCFA).

DA – Domicile Adjustment: For this study, a reduction adjustment being applied to all Long-Term Care beneficiaries' total expenditures to account for 'room and board' not paid for HCBS beneficiaries.

DHHS – United States Department of Health and Human Services: The cabinet-level department of the U.S. federal government, with the goal of protecting the health of all Americans and providing essential human services.

DRI - Dietary Reference Intake: A set of **reference** values used to plan and assess nutrient **intakes** of healthy people.

FY – Fiscal Year: A year as reckoned for taxing or accounting purposes.

HCFA – Health Care Administration: The former federal agency that ran the Medicare program. The federal agency also was responsible for collaborating the States to run the Medicaid program. The agency worked to make sure that the beneficiaries in these programs are able to get high quality health care. HCFA was the predecessor of CMS.

IADL – Instrumental Activities of Daily Living: Basic activities that one must be able to perform to live independently in the community, including, but not limited to: managing money, telephony, grocery shopping, personal shopping, using transportation, housekeeping, doing chores, medication management, etc.

IPSW/IPTW – Inverted Propensity Score Weighting/Inverted Probability Treatment Weighting: An alternative to direct matching or matching on propensity scores involves the use of the inverse or propensity scores in a weighted regression framework.

MCO – Managed Care Organization: A continuum of organizations that provide managed care, each operating with slightly different business models. Some organizations are made with physicians, while others are combinations of physicians, hospitals, and other providers.

MH H - Stand Alone Hospice Medicaid (community and nursing home): Medicaid benefits awarded based upon meeting eligibility requirements for coverage of hospice benefits.

MI - Stand Alone Institutional Care Medicaid: Medicaid benefits awarded based upon meeting eligibility requirements for coverage of institutional benefits.

MLTSS – Managed Long-Term Services and Supports: A spectrum of wellness and social services that support elders or people with disabilities who need help with activities of daily living and instrumental activities of daily living, where program administration is outsourced to a Managed Care Organization.

MS - SSI Medicaid: Medicaid eligibility secured through the Supplemental Security Income, a benefit through a beneficiary's Social Security disability.

MW A - Home and Community Based Services: Medicaid benefits awarded based upon meeting eligibility requirements for coverage of home and community based benefits.

NF – Nursing Facility: One of many settings for long-term services and supports, where the beneficiary resides in an institution and receives their supported self-care services.

NFLOC – Nursing Facility Level of Care: Respective state's Medicaid required criteria, including but not limited to: degree of required supported self-care, number of prescriptions, number and severity of comorbidities, existence/quality of natural supports, mental competence that qualifies a beneficiary for admission into a skilled nursing facility or nursing facility.

LOS – Length of Stay: The length of an inpatient episode of care, calculated from the day of admission to the day of discharge, and based on the number of nights spent in the acute care facility.

LTC – Long-Term Care: One of two beneficiary cohorts in a LTSS program. LTC beneficiaries elect to receive their long-term services and supports within the most restrictive domicile, a Medicaid certified nursing facility.

LTSS – Long-Term Services and Supports: A spectrum of wellness and social services that support elders or people with disabilities who need help with activities of daily living and instrumental activities of daily living.

PCP – Primary Care Provider: A health care practitioner who sees people that have common medical problems. This person is most often is a Medical Doctor (MD) or Doctor of Osteopathy (DO). However, a PCP may also be a physician assistant or an Advanced Registered Nurse Practitioner (ARNP).

PCS – Personal Care Services: A spectrum of services to support a beneficiary's activities of daily living, (e.g., meal preparation, feeding, toileting, transferring, ambulation assistance, continency control, etc.).

POC – Plan of Care: Is a written document, developed by the beneficiary, with assistance by the CC/CM that resides with the beneficiary. The document directs

the day-to-day care to be provided to the beneficiary to ensure completion of their ADLs, IADLs, health care visits, treatments and socio-economic services.

PMPM – Per Member Per Month: A calculation often used by health insurance companies to determine the average cost for health care for each of their members.

SAS - Statistical Analysis System: A software suite developed by SAS Institute for advanced analytics, multivariate analyses, business intelligence, data management, and predictive analytics.

SMMC-LTC – Statewide Medicaid Managed Care – Long-Term Care: The State of Florida, Agency for Health Care Administration’s LTSS program, which is a spectrum of wellness and social services that support elders or people with disabilities who need help with activities of daily living and instrumental activities of daily living.

SNF - Skilled Nursing Facility: A Medicare and Medicaid recognized type of nursing facility that in addition to regular nursing facility services provides medically prescribed treatments for beneficiaries’ that meet the respective states’ nursing facility level of care, qualifying the beneficiary for inpatient skilled nursing services.

APPENDIX B
LTSS COVERED SERVICES BY COHORT

Home and Community Based Services (HCBS):

Adult Companion Care – Non-medical care, supervision and socialization provided to a functionally impaired adult. Companions assist or supervise the enrollee with tasks such as meal preparation or laundry and shopping, but do not perform these activities as discreet services. The provision of companion services does not entail hands-on nursing care. This service includes light housekeeping tasks incidental to the care and supervision of the enrollee.

Adult Day Health Care – Services furnished in an outpatient setting which encompass both the health and social services needed to ensure optimal functioning of an enrollee, including social services to help with personal and family problems and planned group therapeutic activities. Adult day health care includes nutritional meals. Meals are included as part of this service when the patient is at the center during meal times. Adult day health care provides medical screening emphasizing prevention and continuity of care, including routine blood pressure checks and diabetic maintenance checks. Physical, occupational and speech therapies indicated in the enrollee's plan of care are furnished as components of this service. Nursing services, which include periodic evaluation, medical supervision and supported self-care services directed toward activities of daily living and personal care services, are also a component of this service. The inclusion of physical, occupational and speech therapy services, and nursing services as components of adult day health services does not require the managed care organization to contract with the adult day health provider to deliver these services when they are included in an enrollee's plan of care. The managed care organization may contract with other providers qualified to deliver these services to deliver adult day health care in compliance with a contract.

Assistive Care Services – An integrated set of twenty-four (24) hour services only for Medicaid-eligible residents in adult family care homes.

Assisted Living – Services comprised of personal care, homemaker, chore attendant care, companion care, medication oversight and therapeutic social and recreational programming provided in a home-like environment within an assisted living facility, in conjunction with living in the facility. Service providers shall ensure enrollees reside in a facility offering supported self-care characteristic in accordance with *Assistive Care Services*, described above. The service includes twenty-four (24) hour onsite response staff to meet scheduled or unpredictable needs in a way that promotes maximum dignity independence, and to provide supervision, safety and security. Individualized care is furnished to enrollees who reside in their won living units (which may include dual occupied units with both occupants' consent to the arrangement) which may or may not include kitchenette and/r living rooms and which contain bedrooms and toilet facilities. The enrollee has a right to privacy. Living units may be locked at the discretion of the resident, except when a physician or mental health professional has certified in writing that the resident is sufficiently cognitively impaired as to be a danger to self or others if given the opportunity to lock the door, and all protections have been met to ensure enrollees' rights have not been violated. The facility shall have a central dining room, living room or parlor, and common activity areas, which may also serve as living rooms or dining rooms. The resident retains the right to assume risk, tempered only by a person's ability to assume responsibility for that risk. Care shall be furnished in a way that fosters the independence of each occupant to facilitate aging in place. Routines of care provision and service delivery shall be consumer-driven to the maximum extent possible, and treat each person with dignity and respect. The managed care organization may arrange for other authorized service providers to deliver care to residents of assisted living facilities (ALF) in the same manner as those services should be delivered to a person in their own home. ALF administrators, direct service personnel and other outside service personnel such as physical therapists have a responsibility to encourage enrollees to take part in social, education and recreational activities they are capable of enjoying. All services provided by the assisted living facility shall be included in a care plan maintained at the facility with a copy provided to the enrollee's case manager. The manger care organization shall be responsible for placing enrollees in the appropriate ALF setting based on each enrollee's choice and service needs.

Attendant Care – Direct service delivery, of both a supportive and health-related nature, specific to the needs of a medically stable, physically handicapped individual. Supportive self-care services are those which substitute for the absence, loss, diminution or impairment of a physical or cognitive function., This service may include skilled or nursing care to the extent permitted by state law. Housekeeping activities which are incidental to the performance of care may also be furnished as part of this activity.

Behavior Management – This service provides behavioral health care services to address mental health or substance abuse needs of members. These services are more than standard community behavioral health services. The services are

used to maximize reduction of the enrollee's disability and restoration to the best possible functional level and may include but are not limited to: an evaluation of the origin and trigger of the presenting behavior; development of strategies to address the behavior; implementation of an intervention by the provider; and assistance for the caregiver in being able to intervene and maintain the improved behavior.

Caregiver Training – Training and counseling services for individuals who provide unpaid support, training companionship or supervision to enrollees. For purposes of this service, individual is defined as any person, family member, neighbor, friend, companion or co-worker who provides uncompensated care, training, guidance, companionship or support to an enrollee. This service may not be provided to train paid caregivers. Training includes instruction about treatment regimens and other services included in the plan of care, use of equipment specified in the plan of care, and includes updates as necessary to safely maintain the enrollee at home. Counseling shall be aimed at assisting the unpaid caregiver in meeting the needs of the enrollee. All training for individuals who provide unpaid support to the enrollee shall be included in the enrollee's plan of care.

Care Coordination/Management (CC/CM) – Services that assist enrollees in gaining access to needed long-term care services and supports, as well as other needed medical, social, and educational services, regardless of the funding source for the services to which access is gained. CC/CM services contribute to the coordination and integration of care delivery through the ongoing monitoring of service initiation, service provision as prescribed at the most appropriate level of care, elected by the enrollee, as prescribed in each enrollee's plan of care.

Home Accessibility Adaption Services – Physical adaptations to the home required by the enrollee's plan of care which are necessary to ensure the health, welfare and safety of the enrollee or which enable the enrollee to function with greater independence in the home and without which the enrollee would require institutionalization. Such adaptations may include the installation of ramps and grab-bars, widening of doorways, modification of bathroom facilities or installation of specialized electronic and plumbing systems to accommodate the medical equipment and supplies, which are necessary for the welfare of the enrollee. Excluded are those adaptations or improvements to the home that are of general utility and are not of direct medical or remedial benefit to the enrollee, which as carpeting, roof repair or central air conditioning. Adaptations which add to the total square footage of the home are not included in this service. All services shall be provided in accordance with applicable state and local building codes.

Home Delivered Meals – Nutritionally sound meals to be delivered to the residence of the enrollee who has difficulty shopping for or preparing food without assistance. Each meal is designed to provide a minimum of thirty-three and three tenths percent (33.3%) of the current Dietary Reference Intake (DRI). The meals

shall meet the current Dietary Guidelines for Americans from the USDA My Plate food intake pattern and reflect the predominant statewide demographic.

Homemaker Services – General household activities such as meal preparation and routine household care provided by a trained homemaker when the individual regularly responsible for these activities is temporarily absent or unable to manage these activities. Chore services, including heavy chore services and pest control may be included in this service.

Hospice – Forms of palliative medical care and services designed to meet the physical social, psychological, emotional and spiritual needs of terminally ill recipients and their families. Hospice focuses on palliative care rather than curative care. An individual is considered to be terminally ill if they have a medical diagnosis with a life expectancy of six (6) months or less if the disease runs its normal course.

Intermittent and Skilled Nursing – The scope and nature of these service do not differ from skilled nursing furnished under a State Plan. This service includes the home health benefit available under the Medicaid state plan as well as expanded nursing services coverage under waiver services. Services listed in the plan of care that are within a states' Nurse Practice Act and are provided by a registered professional nurse or licensed practical or vocational nurse under the supervision of a registered nurse, licensed to practice in the state. Skilled nursing services shall be listed in the enrollee's plan of care and are provided on an intermittent basis to enrollees who either do not require continuous nursing supervision or whose need is predictable.

Medical Equipment and Supplies – Medical equipment and supplies, specified in the plan of care, include:

- a. Devices, controls or appliances that enable the enrollee to increase the ability to perform activities of daily living;
- b. Devices controls or appliances that enable the enrollee to perceive, control or communicate the environment in which they live;
- c. Item necessary for life support or to address physical conditions along with ancillary supplies and equipment necessary to the proper functions of such items;
- d. Such other durable and non-durable medical equipment that is necessary to address enrollee functional limitations;
- e. Necessary medical supplies not available under the respective states' plan including consumable medical supplies such as adult disposable diapers.

These services include the durable medical equipment benefits available under the state plan service as well as expanded medical equipment and supplies coverage under respective waiver programs. All items must meet applicable

standards of manufacture, design and installation. This service also includes repair of such items as well as replacement parts.

Medication Administration – Assistance with self-administration of medications, whether in the home or a facility, includes taking the medication from where it is stored and delivering to the enrollee; removing a prescribed amount of medication from the container and placing it in the enrollee's hand or another container, helping the enrollee by lifting the container to their mouth; applying topical medications; and keeping a record of when an enrollee receives assistance with self-administration of their medications.

Medication Management – Review by a licensed nurse or pharmacist of all prescriptions and over-the-counter medications taken by the enrollee, in conjunction with the enrollee's physician on at least an annual or as needed basis upon a significant change in the enrollee's condition. The purpose of the review is to assess whether the enrollee's medication is accurate, valid, non-duplicative and correct for the diagnosis; that therapeutic doses and administration are at an optimum level; that there is appropriate laboratory monitoring and follow-up occurring; and that drug interactions, allergies and contraindications are being assessed and prevented.

Nutritional Assessment/Risk Reduction Services – A direct service assessment and guidance to caregivers and enrollees with respect to nutrition. This service teaches caregivers and enrollees to follow dietary specifications that are essential to the enrollees to follow dietary specifications that are essential to the enrollee's health and physical functioning. How to prepare and eat nutritionally appropriate meals and promote better health through improved nutrition. This service may include instructions on shopping for quality food and food preparation.

Nursing Facility Services – Services furnished in a health care facility as licensed by the respective state and certified by the State's Medicaid department/agency. Services are defined in the States' Medicaid plan between the respective state and CMS. These services include temporary, step-down post-acute care for rehabilitation and long-term custodial-care.

Personal Care – Services that provide assistance with eating, bathing, dressing, continency control, personal hygiene, grooming or other activities of daily living. This service ranges from simple verbal reminding to complete care of the enrollee. This service includes assistance with meal preparation but does not include the cost of the meal. This service may also include housekeeping chores such as bed making, dusting and vacuuming, which are incidental to the care furnished or are essential to the health and welfare of the enrollee, rather than the enrollee's family.

Personal Emergency Response Systems (PERS) – The installation and service of an electronic monitoring device that enables enrollees at risk of institutionalization of secure help in an emergency. The PERS is connected to the person's phone and programmed to signal a response center once a 'help' button is activated. The enrollee may also wear a portable 'help' button to allow for mobility. PERS services are generally limited to those enrollees who live alone or who are alone for significant periods of the day and who would otherwise require low to moderate supervision.

Respite Care – Services provided to enrollees unable to care for themselves furnished on a short-term basis due to the absence or need for relief of persons normally providing the care. Respite care does not substitute for the care usually provided by a registered nurse, a licensed practical nurse or a therapist. Respite care is provided in the home/place of residence, Medicaid licensed hospital, nursing facility or assisted living facility.

Occupational Therapy – Treatment to restore, improve or maintain impaired functions aimed at increasing or maintaining the enrollee's ability to perform tasks required for independent functioning when determined through a multi-disciplinary assessment to improve an enrollee's capability to live safely in the home setting.

Physical Therapy – Treatment to restore, improve or maintain impaired functions by use of physical, chemical and other properties of heat, light, electricity or sound and by massage and active, resistive or passive exercise. There shall be an explanation that the patient's condition will be improved significantly (the outcome of the therapies shall be measurable by the attending medical professional) in a reasonable (and generally predictable) period based on an assessment of restoration potential or a determination that series are necessary to a safe and effective maintenance program.

Respiratory Therapy – Treatment of conditions that interfere with respiratory functions or other deficiencies of the cardiopulmonary system. Services include evaluation and treatment related to pulmonary dysfunction.

Speech Therapy – The identification and treatment of neurological deficiencies related to feeding problems, congenital or trauma-related maxillofacial anomalies, autism or neurological conditions that effect oral motor functions. Therapy services include the evaluation and treatment of problems related to an oral motor dysfunction when determined through a multi-disciplinary assessment to improve an enrollee's capability to live safely in the home setting.

Transportation – non-emergent transportation services shall be offered in accordance with the enrollees' plan of care and coordinated with other service delivery systems. This non-emergency transportation services includes trips to

and from services offer by the managed care organization and includes tripe to and from the managed care organization's expanded benefits.

Long-Term Care (LTC):

Care Coordination/Management (CC/CM) – Services that assist enrollees in gaining access to needed long-term care services and supports, as well as other needed medical, social, and educational services, regardless of the funding source for the services to which access is gained. CC/CM services contribute to the coordination and integration of care delivery through the ongoing monitoring of service initiation, service provision as prescribed at the most appropriate level of care, elected by the enrollee, as prescribed in each enrollee's plan of care.

Intermittent and Skilled Nursing – The scope and nature of these services are listed in the plan of care that are within a states' Nurse Practice Act and are provided by a registered professional nurse or licensed practical or vocational nurse under the supervision of a registered nurse, licensed to practice in the state. Skilled nursing services shall be listed in the enrollee's plan of care and are provided on an intermittent basis to enrollees who either do not require continuous nursing supervision or whose need is predictable.

Medical Equipment and Supplies – Medical equipment and supplies, specified in the plan of care, include:

- f. Devices, controls or appliances that enable the enrollee to increase the ability to perform activities of daily living;
- g. Devices controls or appliances that enable the enrollee to perceive, control or communicate the environment in which they live;
- h. Item necessary for life support or to address physical conditions along with ancillary supplies and equipment necessary to the proper functions of such items;
- i. Such other durable and non-durable medical equipment that is necessary to address enrollee functional limitations;
- j. Necessary medical supplies not available under the respective states' plan including consumable medical supplies such as adult disposable diapers.

These services include the durable medical equipment benefits available under the state plan service as well as expanded medical equipment and supplies coverage under respective waiver programs. All items must meet applicable standards of manufacture, design and installation. This service also includes repair of such items as well as replacement parts.

Medication Administration – Assistance with self-administration of medications, whether in the home or a facility, includes taking the medication from where it is stored and delivering to the enrollee; removing a prescribed amount of medication from the container and placing it in the enrollee's hand or another

container, helping the enrollee by lifting the container to their mouth; applying topical medications; and keeping a record of when an enrollee receives assistance with self-administration of their medications.

Medication Management – Review by a licensed nurse or pharmacist of all prescriptions and over-the-counter medications taken by the enrollee, in conjunction with the enrollee’s physician on at least an annual or as needed basis upon a significant change in the enrollee’s condition. The purpose of the review is to assess whether the enrollee’s medication is accurate, valid, non-duplicative and correct for the diagnosis; that therapeutic doses and administration are at an optimum level; that there is appropriate laboratory monitoring and follow-up occurring; and that drug interactions, allergies and contraindications are being assessed and prevented.

Nutritional Assessment/Risk Reduction Services – A direct service assessment and guidance to caregivers and enrollees with respect to nutrition. This service teaches caregivers and enrollees to follow dietary specifications that are essential to the enrollees to follow dietary specifications that are essential to the enrollee’s health and physical functioning. How to prepare and eat nutritionally appropriate meals and promote better health through improved nutrition. This service may include instructions on shopping for quality food and food preparation.

Nursing Facility Services – Services furnished in a health care facility as licensed by the respective state and certified by the State’s Medicaid department/agency. Services are defined in the States’ Medicaid plan between the respective state and CMS. These services include temporary, step-down post-acute care for rehabilitation and long-term custodial-care.

Occupational Therapy – Treatment to restore, improve or maintain impaired functions aimed at increasing or maintaining the enrollee’s ability to perform tasks required for independent functioning when determined through a multi-disciplinary assessment to improve an enrollee’s capability to live safely in the home setting.

Physical Therapy – Treatment to restore, improve or maintain impaired functions by use of physical, chemical and other properties of heat, light, electricity or sound and by massage and active, resistive or passive exercise. There shall be an explanation that the patient’s condition will be improved significantly (the outcome of the therapies shall be measurable by the attending medical professional) in a reasonable (and generally predictable) period based on an assessment of restoration potential or a determination that series are necessary to a safe and effective maintenance program.

Respiratory Therapy – Treatment of conditions that interfere with respiratory functions or other deficiencies of the cardiopulmonary system. Services include evaluation and treatment related to pulmonary dysfunction.

Speech Therapy – The identification and treatment of neurological deficiencies related to feeding problems, congenital or trauma-related maxillofacial anomalies, autism or neurological conditions that effect oral moral functions. Therapy services include the evaluation and treatment of problems related to an oral motor dysfunction when determined through a multi-disciplinary assessment to improve an enrollee's capability to live safely in the home setting.

APPENDIX C
AHCA ELIGIBILITY CODES AND DESCRIPTIONS

1. MW C - HOME AND COMMUNITY BASED SERVICES (CHANNELING)
2. MW A - HOME AND COMMUNITY BASED SERVICES
3. MS - SSI MEDICAID
4. MM S - MEDS FOR AGED AND DISABLED
5. MI - STAND ALONE INSTITUTIONAL CARE MEDICAID
6. MI M - INSTITUTIONAL CARE MEDICAID SUPPLEMENT TO MEDS-AD
7. MI S - INSTITUTIONAL CARE MEDICAID SUPPLEMENT TO SSI
8. MI P - INSTITUTIONAL CARE MEDICAID SUPPLEMENT TO Protected Medicaid
9. MH H - STAND ALONE HOSPICE MEDICAID (community and nursing home)
10. MH M - HOSPICE MEDICAID SUPPLEMENTAL TO MEDS-AD (MMS)
11. MH S - HOSPICE MEDICAID SUPPLEMENTAL TO SSI
12. MH P - HOSPICE MEDICAID SUPPLEMENTAL TO PROTECTED MEDICAID
13. MT A - PROTECTED MEDICAID FOR WIDOWS I AND CHILDREN
14. MT C - REGULAR PROTECTED MEDICAID (COLA)
15. MT D - PROTECTED MEDICAID FOR DISABLED ADULT CHILDREN
16. MT S - PROTECTED MEDICAID DUE TO SSI DISABILITY CHANGE
17. MT W - PROTECTED MEDICAID FOR WIDOWS II

APPENDIX D
IRIS HUMAN SUBJECT RESEARCH WAIVER



Human Subjects Protection Program Office
MedCenter One – Suite 200
501 E. Broadway
Louisville, KY 40202-1798
Office: 502.852.5188 Fax: 502.852.2164

DATE: July 05, 2016
TO: Maresa R Corder RN, MPA
FROM: The University of Louisville Institutional Review Board
IRB NUMBER: 16.0594
STUDY TITLE: **Comparing Expenditures By Source of Long-Term Services and Supports**
REFERENCE #: 569840
DATE OF REVIEW: 06/30/2016
IRB STAFF CONTACT: Barbara Dearing, BS, CIP
(502)852-5987
badear01@louisville.edu

The IRB Chair/Vice-Chair has reviewed your submission and the project described does not meet the "Common Rule" definition of human subjects' research. Therefore, this research project does not require IRB review prior to conducting the research.

If you have any questions, please contact the HSPPO office at (502) 852-5188.

Thank you for your submission.

Sincerely,

A handwritten signature in black ink that reads "Laura Clark M.D." in a cursive style.

Laura Clark, M.D., Chair
Biomedical Institutional Review Board

CURRICULUM VITA

NAME: Märesa R. Corder, RN, MPA, CCP

ADDRESS: 5896 Lake Cyrus Drive
Hoover, AL 35244

DOB: Chattanooga, TN – December 21, 1957

EDUCATION & TRAINING:

A.D.N., Nursing
Hillsborough Community College, Tampa, FL
1981-1983

B.S. – Business Administration, Miami, FL
Barry University
1992-1994

M.P.A. Public Administration
Nova Southeastern University, Ft. Lauderdale, FL
1994-1996

PhD Public Health/Healthcare Management
University of Louisville, Louisville, KY
2012-2017

AWARDS: 2013 Humana President's Award
1996 Nova Southeastern Dean's List x3 Semesters
1995 Nova Southeastern Dean's List x3 Semesters
1994 Nova Southeastern Dean's List x3 Semesters
1993 Barry University Dean's List x3 Semesters
1993 Barry University Dean's List x3 Semesters
1983 Hillsborough Community College Leadership Award
1983 Who's Who in American Community College

PROFESSIONAL SOCIETIES:

America Nurses Association 1976 – Present
Alabama Nurses Association 2015 – Present

PROFESSIONAL SOCIETIES:

(continued)

Case Management Society Of America	1998 – Present
American Society for Public Administration	1994 – Present

PROFESSIONAL LICENSURE:

Chronic Care Plan Certification	Issued: 11/2009
	Expiration: Evergreen
State of Florida Board of Nursing RN 1518062	Issued: 4/1984
	Expiration: 4/2019
State of Tennessee Board of Nursing RN 0000168204	Issued: 11/2008
	Expiration: 11/2018
State of Alabama Board of Nursing RN 1-119862	Issued: 10/08
	Expiration: 10/2018
University of Southern California – Home Modification Certification	Issued: 08/11
	Expiration: Evergreen

INVITED

PRESENTATIONS:

National Association of States United for Aging and Disabled (NASUAD) Annual Home and Community Based Services (HCBS) – Breakout Workshop: Managed Care and Long-Term Services and Supports	09/2009 Washington DC Marriott - Alexandria Crystal City
NASUAD Annual HCBS – Breakout Workshop: True North: How To Outreach The Local MCO Leaders	09/2010 Washington DC Marriott – Alexandria Crystal City
NASUAD Annual HCBS – Breakout Workshop: Partnering with a for profit: Who to Approach, Locally	09/2011 Washington DC Marriott – Alexandria Crystal City
NASUAD Annual HCBS – Breakout Workshop: When Pitching the MCO: You Have To Speak Their Language.	09/2012 Washington DC Marriott – Alexandria Crystal City

<p>INVITED PRESENTATIONS: (continued)</p>	<p>NASUAD Annual HCBS – Breakout Workshop: How Hard to Push in the Negotiation – Invest for the Long-Term. NASUAD Annual HCBS – Breakout Workshop: Aligning The Spirit of the Contract Vs. The Letter of the Law NASUAD Annual HCBS – Breakout Workshop: Contract Performance: Measuring Outcomes NASUAD Annual HCBS – Breakout Workshop: Partnering With MCO’s for Upcoming Re-Procurement National Association for Area Agencies on Aging (n4a) Annual National Conference: Break-Out Workshop Managed Care’s Role in Long-Term Services and Supports n4a Annual National Conference Break-Out Workshop: Starting The Dialogue with MCOs Agencies on Aging (n4a) Annual LTSS Policy Meeting: MCO Representative Panelist: Starting The Dialogue with a MCO n4a Annual National Conference Break-Out Workshop: Starting The Dialogue with MCOs n4a Annual LTSS Policy Meeting Representative Panelist: Negotiating the Best Deal: Thinking About the Long-Term n4a Annual National Conference Break-Out Workshop: Negotiating the Deal: Getting to Closing n4a Annual LTSS Policy Meeting Representative Panelist: Ensuring Alignment with Access,</p>	<p>09/2013 Washington DC Marriott – Alexandria Crystal City 09/2014 Washington DC Marriott – Alexandria Crystal City 09/2015 Washington DC Marriott – Alexandria Crystal City 09/2016 Washington DC Marriott – Alexandria Crystal City 8/2010 Portland, OR 8/2011 Orlando, FL 4/2012 Washington DC 8/2012 Chicago, IL 4/2013 Washington DC 8/2013 Louisville, KY 4/2014 Washington DC</p>
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INVITED Cost and Quality Performance
 PRESENTATIONS: Criteria Ordering
 (continued) n4a Annual National Conference 8/2014
 Break-Out Workshop: Dallas, TX
 Access, Cost and Quality
 Performance Criteria Ordering
 n4a Annual LTSS Policy Meeting 4/2015
 Representative Panelist: Washington DC
 Measuring Performance: Priorities
 To Ensure Re-Procurement
 n4a Annual National Conference 8/2015
 Break-Out Workshop: Philadelphia, PA
 Partnering to a Win-Win-Win:
 AAA-MCO-State
 n4a Annual LTSS Policy Meeting 4/2016
 Representative Panelist: Washington DC
 Being Agile, When the Market
 Turns: Unexpected Contract
 Terminations
 n4a Annual National Conference 8/2016
 Break-Out Workshop: San Diego, CA
 Being Agile, When the Market
 Turns
 National Association of Medicaid 11/10
 Directors (NAMD) Annual Washington DC
 National Conference Break-Out Hyatt Regency
 Workshop: True North: How Crystal City
 To Outreach Local MCO Leaders
 NAMD Annual National 11/12
 Conference Break-Out Washington DC
 Workshop: Starting a Serious Hyatt Regency
 Dialogue with MCO Leadership Crystal City
 To Outreach Local MCO Leaders
 NAMD Annual National 11/14
 Conference Break-Out Washington DC
 Workshop: Aligning Access Hyatt Regency
 Dialogue with MCO Leadership Crystal City
 Cost and Quality Performance
 Criteria
 NAMD Annual National 11/16
 Conference Break-Out Washington DC
 Workshop: Partnering with Hyatt Regency
 AAA's Collaborating with
 Community SME