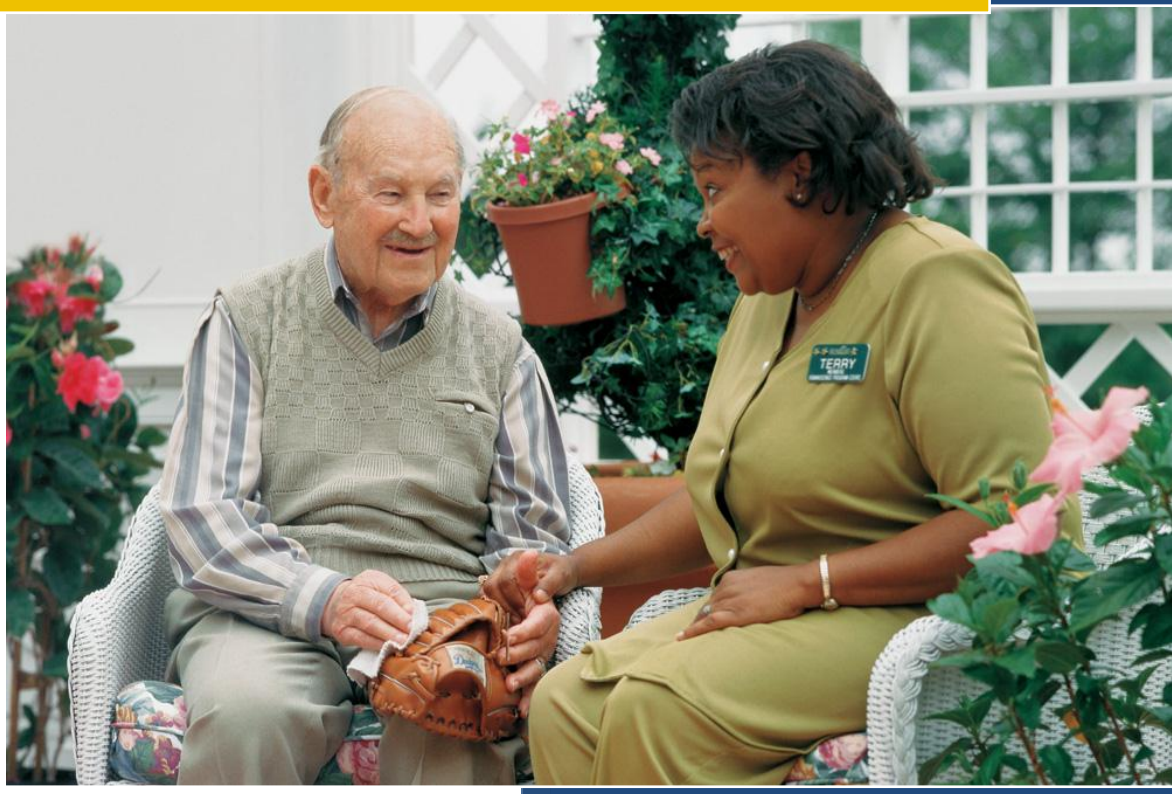
Final Report

Program of All-inclusive Care for the Elderly (PACE) Medicaid Cost-Benefit Study



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Executive Summary

Purpose. The purpose of the Program of All-inclusive Care for the Elderly (PACE) Medicaid Cost-Benefit Study was to examine both costs and benefits of the PACE program for the State of Kansas. We investigated whether PACE produces cost savings for the Medicaid program, in comparison to Home and Community Based Services/Frail Elderly waiver (HCBS/FE) and to nursing facilities (NFs). These programs provide long term care (LTC) to older Kansans on Medicaid. Additionally, benefits were examined by comparing selected health outcomes (e.g., hospital admissions, long term NF admissions, mortality) across these groups. PACE is a unique long term program in which a single PACE provider is responsible for all health care and LTC needs under a fixed capitated payment. There are two PACE providers in the State of Kansas -- Midland Care, based in Topeka, Kansas, and Via Christi, based in Wichita, Kansas.

Methods. Cost expenditures and benefits for PACE customers age sixty-five and over were compared to similarly-matched HCBS/FE and NF customers. These LTC customers were matched according to demographic characteristics and functional capacities, using data collected through the Medicaid Management Information Systems (MMIS) database and the Level of Care Threshold (LOC) score. The LOC score was computed based on a functional assessment designed to determine whether older adults are eligible for NF care, and serves as the gateway for PACE, HCBS/FE, and NF services. All Medicaid costs, including routine health care costs, acute care costs, and LTC costs, were gathered through MMIS and analyzed. Data on mortality and benefits, including hospitalizations, emergency room (ER) visits, and NF long term admissions, were collected through the MMIS database and from PACE records.

This study tracked costs and benefits for matched clients enrolled in one of the three LTC programs between 2006 and 2011, beginning at the time of enrollment through death or the end of the study period. In order to adequately capture program effects, the study was limited to customers who were enrolled in one of these LTC programs for at least 90 days, which resulted in a sample of 136 PACE customers, 272 HCBS/FE customers, and 272 NF customers. There were twice as many HCBS/FE and NF study participants compared to PACE study participants because we oversampled from the HCBS/FE and NF groups using a *two-to-one matching* technique, further explained in Section III of the main report. Essentially, this procedure increased the accuracy of matches to the PACE group. We tracked costs and benefits for individual study participants longitudinally for up to three years, and considered four-year weighted aggregate costs and benefits across these matched groups. We also analyzed cost differentials for matched PACE, HCBS/FE, and NF study participants among four subgroups of customers with different cognitive and LOC needs.

Findings. Key results are detailed below:

- HCBS/FE expenditures were about 17% lower than expenditures for similar PACE customers, costing an average of $320 less per person per month over a four-year weighted aggregate period. The spending gap narrowed over time; however, PACE always cost more than HCBS with the notable exception of before-death costs.

- Although PACE cost more than HCBS/FE, on average, Medicaid expenditures were similar when comparing costs for those with greater cognitive needs and greater Activities of Daily Living (ADL)/Instrumental Activities of Daily Living (IADL) needs.
- Rate setting mechanisms ensure that PACE expenditures will be lower than those for NFs; and our analysis of actual cost data revealed that PACE Medicaid expenditures were much lower than those for similar NF customers at all points in time, with a four-year weighted average monthly savings of over $1,000 (38%) per customer.
- PACE Medicaid expenditures were significantly lower than both HCBS/FE and NF customers during the three-month period before death. PACE before-death costs were 43% lower than HCBS/FE costs and 33% lower than NF costs (saving $3,907 and $2,594, respectively).
- The before-death PACE savings indicates a need to track and compare Medicaid expenditures through death to truly understand overall savings potential for the PACE program. Throughout our study period, only about 25% of PACE study participants, 25% of HCBS/FE study participants, and 40% of NF study participants died.
- PACE study participants were admitted to the hospital as often as similar HCBS/FE and NF customers; however, PACE customers spent significantly fewer days in the hospital.
- Both PACE and HCBS/FE study participants experienced few long term NF admissions, at just 15% of the population in each group.
- Table 1 below summarizes cost findings over a four-year aggregate period.

Table 1. Average Monthly Medicaid Expenditures[1] across Matched Medicaid LTC Study Participants

	Average Medicaid Expenditures, Per Customer Per Month
PACE	$1,832
HCBS/FE	$1,512***
NF	$2,968***

*Significant at: * p< .10, **p< .05, *** p<.01; significantly different in comparison to PACE participants.*

1. This four-year average is weighted to account for various lengths of time that customers spent in their respective Medicaid LTC program.

In conclusion, PACE is a cost-effective, community-based alternative for older Kansans at high risk of NF admission. PACE Medicaid expenditures are similar to those for HCBS/FE customers with greater functional needs, and less for customers at the end of life. However, Medicaid expenditures for HCBS/FE customers were lower, on average, for the entire matched PACE sample over a four-year weighted aggregate period. This study also illustrates data challenges that require careful consideration when evaluating capitated plans.

I. Introduction

Project Description

The purpose of this study was to examine both Medicaid costs to the state and benefits of the PACE program in comparison to Home and Community Based Services/Frail Elderly waiver (HCBS/FE) and to Nursing Facilities (NFs). PACE is a managed care program that combines traditional health care coverage with coverage for long term care (LTC) services. PACE providers accept a capitated payment rate from the Kansas Department for Aging and Disability Services (KDADS) in the form of a monthly premium to provide all Medicaid/Medicare LTC and medical services in an integrated care setting. This includes in-home services that might otherwise be accessed through the HCBS/FE waiver program, as well as NF services.

The PACE model is intended to save money while also improving quality of care, but a deeper analysis was needed to determine whether this is true in Kansas. PACE rates are negotiated at a percentage below actuarial projections predict the State should expect to pay to care for eligible NF customers. This rate formula captures long term costs, but not necessarily acute health care costs for Medicaid NF beneficiaries. Furthermore, this rate setting formula does not take HCBS/FE cost projections into account. PACE operates on a holistic, integrated care model that is thought to improve quality of care; however, additional research was needed to document possible non-monetary outcomes. KDADS contracted with the Office of Aging and Long Term Care (OALTC) of the University of Kansas (KU) School of Social Welfare to conduct a research project to analyze expenditures and benefits for similarly matched individuals who chose different Medicaid LTC options (i.e., PACE, HCBS/FE, or NF).

To compare costs and benefits, we matched 136 PACE customers to 272 HCBS/FE and 272 NF customers by demographic and functional capacity characteristics. State Medicaid expenditures and health outcomes, including hospitalizations, ER visits, NF admissions, and mortality, were tracked for study participants in these programs between 2006 and 2011.

Background Research on PACE

PACE is a unique LTC program with a focus on coordinated care (see details in the next section of this report). PACE became a Medicare and Medicaid provider program because of the potential for improving long term and health care for older adults, while also containing costs. PACE programs vary, which has led to mixed research findings (Mukamel, et al., 2007; Weiland, et al., 2000). Yet for the most part, evaluative research has demonstrated several positive outcomes for PACE participants, including fewer hospital stays and NF admissions (Beauchamp, et al., 2008; Chatterji, et al., 1998; Friedman, et al., 2005; Meret-Hanke, 2011; National PACE Association, 2002; Weiland, et al., 2000). Research has also found that PACE participants have higher survival advantage compared to those in HCBS/FE or NFs, after adjusting for risk (Wieland et al., 2010). PACE services may also help narrow racial health disparities, as one study found gaps in survival advantage and functional decline closed across Black and White enrollees (Tan et al., 2003).

PACE creates incentives to contain rising health care and LTC costs. As PACE assumes full risk for hospital and NF care, there are strong incentives to emphasize effective treatments. The cost-effectiveness of PACE is also premised on the long term savings that can be achieved through holistic care and efforts to reduce excessive end-of-life health care costs (Chatterji, et al., 1998). However, the current evidence on whether PACE actually saves federal and State dollars is mixed. As PACE rates must be set below NF rates, PACE is guaranteed to cost less than NF care. It is not clear whether PACE can save money compared to other LTC options, such as HCBS/FE. A national study found that savings were realized in Medicare spending rather than in Medicaid spending (White, Abel, & Kidder, 2000), while another study found little effect on Medicare expenditures, but increased Medicaid expenditures (Foster et al., 2007).

Numerous studies of PACE have demonstrated positive health outcomes for PACE enrollees. However, research on potential cost-savings of the PACE model has been mixed. This is due in part to state variations in funding, but also to research designs that do not adequately capture the potential long term savings of this model.

Nonetheless these national studies found that potential savings varied widely across states, as each set different Medicaid reimbursement rates, with a few states realizing Medicaid cost savings. Additional research has confirmed state variation. A recent study in South Carolina found that capitated Medicaid payments to PACE were lower than predicted fee-for-service expenditures for equivalent customers (Wieland et al., 2012). In contrast, recent studies in Washington and Ohio found that Medicaid expenditures for PACE where higher than those for HCBS/FE (Mehdizadeh et al., 2012 and Mancuso, Yamashiro, & Felver, 2005). However, there may be savings potential for certain participant subgroups, especially those with the highest risk for NF placement (Mancuso, Yamashiro, & Felver, 2005). Unfortunately, this line of research has been plagued by methodological limitations, including difficulties in identifying comparable groups and limited ability to capture long term savings. In light of these mixed findings and lack of research on PACE sites in Kansas, this current study investigates how much, if any, cost savings have been achieved with the PACE model in Kansas, and if there are certain groups for whom targeting PACE enrollment would be most cost effective.

Report Overview

The following section of this report, *Medicaid LTC Program Profiles*, briefly describes the PACE, HCBS/FE, and NF programs. As each of these Medicaid LTC options is distinct compared to the others, and, therefore, it is important to understand how differences in services and Medicaid billing impact the study design. The third section of the report, *Beneficiary Profiles and Analysis*, describes the criteria used to select and match study participants, and profiles of participant characteristics within and across each comparison group. The fourth section of the report, *Analysis of Costs and Benefits*, analyzes and reports actual costs savings and benefits of the PACE program in comparison to the HCBS/FE and NF LTC alternatives. The report closes with a discussion of main findings and study limitations. A comprehensive description of the methodology is offered in a separate document, the *Technical Addendum*, which is available upon request.

II. Medicaid LTC Program Profiles

What are the characteristics of the three LTC service options? Older adults in Kansas with LTC needs who receive Medicaid services often rely on one of three options for formal services: PACE, HCBS/FE, or NF care. Each of these programs has a unique approach to providing LTC services, and is reimbursed differently by Medicaid. In designing a cost-benefit analysis that allows a comparison across these LTC models, differences of each service setting must be taken into account.

Program of All-inclusive Care for the Elderly (PACE)

PACE is an interdisciplinary, comprehensive program providing both health and LTC for older adults. A permanent Medicare and/or Medicaid program since 1997, it is available to individuals 55 years of age and older who qualify for NF placement (Centers for Medicare and Medicaid Services, 2010). PACE organizations must accept any NF eligible applicant who can live safely in the community with PACE support. Once enrolled, PACE customers are guaranteed PACE services through the end of life; however, they can choose to disenroll from the program at any time without cause. Kansas has two PACE programs which largely serve urban populations. Via Christi HOPE is a PACE program in Wichita, Kansas, serving residents of Sedgwick County. This program has been in operation since September 2002 (Via Christi HOPE, 2011) and currently has 209 enrolled participants (Personal Communication, 2012). Midland Care operates a PACE program in Topeka, Kansas, serving residents of Shawnee, Douglas, Jackson, Jefferson, Osage, Pottawatomie, and Wabaunsee Counties since February 2007 and currently has 105 enrolled participants (Personal Communication, 2011). Nationwide, the average PACE enrollee is 80 years old and has 7.9 medical conditions (National Pace Association, 2003).

PACE is paid according to a capitated, flat-rate monthly premium, which is covered by Medicare, Medicaid, and, to a much lesser extent, private pay sources. The vast majority of frail elders who participate in PACE have either Medicare or Medicaid, and most are dually eligible (Hirth et al., 2009). PACE providers assume full financial risks for providing *all* necessary care under the capitated payment; Medicare and Medicaid are not billed for any additional services (CMS, 2010, 2011a). The PACE program provides for *all* of its participants' health and LTC needs. These services are coordinated and delivered by an interdisciplinary PACE team (Greenwood, 2001; Hirth, Baskins, & Dever-Bumba, 2009; Kodner & Kyriacou, 2000). There is considerable flexibility in meeting the care needs of PACE enrollees, which enables the program to pay for goods and services that would not normally be covered under fee-for-service Medicare or Medicaid models (Greenwood, 2001; Kodner & Kyriacou, 2000; Wagner, Davis, Von Korff, & Austin, 2002). If a PACE enrollee can no longer live safely in the community and requires NF care, the PACE organization must cover this care as well.

Home and Community Based Services/Frail Elderly Waiver (HCBS/FE)

HCBS/FE is a Medicaid waiver program that allows LTC services for the frail elderly to be provided in the home and community. Kansas has had Medicaid waiver services in place since 1982, with the HCBS/FE waiver available since 1997. Nationwide, the use of Medicaid waivers has grown as a way to support elders' ability to remain in the community and avoid NF placement, especially in response to the 1999 *Olmstead* Supreme Court decision. In Kansas, HCBS/FE services and case management are available statewide.

Health and LTC services not provided by the HCBS/FE waiver are covered through traditional fee-for-service Medicare and Medicaid funding. Thus, in contrast to the PACE model in which all services are covered under a single capitated payment, Medicaid is billed for many additional health care services that are not covered under the HCBS/FE waiver. All of these services need to be accounted for in research designs involving cost comparisons across PACE and HCBS/FE models.

Nursing Facilities (NF)

In contrast to PACE and HCBS/FE, which provide community based LTC, NFs provide LTC in an institutional setting. Per federal requirements, Kansas provides long term NF care to residents who are eligible for Medicaid benefits whose conditions require care 24 hours per day. Kansas established regulations and standards of care for NFs in 1978 (Kansas Advocated for Better Care, 1995). The NF model of care has undergone many changes over time, with many NFs in Kansas are now moving towards person-centered care with an emphasis on choice, dignity, and respect (Bott et al., 2009; Kansas Department on Aging, 2011).

NF services are covered under a per diem rate set by a prospective, cost-based, facility-specific rate-setting methodology. Medical and health services not provided by the NF are covered through traditional fee-for-service Medicare and Medicaid funding. Medicaid is billed separately from the set per diem rate for some services that NF residents receive. These additional Medicaid expenditures for NF residents must also be accounted for in a cost comparison research design.

Table 2 outlines the current range of services provided by PACE, HCBS/FE, and NFs via the Kansas Medicaid program.

PACE is a unique program that provides all necessary LTC and health care under a set capitated fee. In contrast, HCBS/FE and NF provide a limited set of LTC and/or health care services, in which additional health care needs are covered separately through traditional fee-for-service Medicaid coverage.

Table 2: Comparative Medicaid LTC Program Services

	Services Included in Program	Services *not* Included in Program
PACE	• Primary health care – physician and nursing • Specialty health care • Mental health care • Hospital care – inpatient and outpatient • Restorative therapies[1] • Dentistry/oral health • Pharmacy services/prescription drugs • Laboratory, x-ray, and other diagnostic services • LTC – home attendant care, adult day care, assisted living, NF care, etc. • End-of-life/palliative care • Sleep cycle support • Respite care • Social services and case management • Recreational therapy • Meals and dietary services • Transportation • Medication reminders and administration • Emergency response • Assistive technology/DME/prosthetics • Home modifications and basic housekeeping • Vision • *All* other necessary health care and LTC services	• None (PACE must provide all necessary services needed to implement plan of care under the capitated monthly payment, regardless of actual costs and at full financial risk)
HCBS/FE	• Nursing evaluation visit • Wellness monitoring • LTC – home attendant care, adult day care • Home telehealth[2] • Case management • Financial management services[2] • Personal emergency response • Medication reminders • Basic housekeeping • Selected services as provided by Assisted Living, Residential Care, Home Plus, or Boarding Care[3] • Dentistry/oral health[4] • Assistive technology/DME[4] • Sleep cycle support[4] • Comprehensive support[4]	• Primary health care • Specialty health care • Mental health care • Diagnostic service • Pharmacy services • Hospital care • Dental care • Assistive technology/DME/prosthetics • Vision • LTC – NF care • Restorative therapies • Medical transportation
NF	• 24-hour nursing care • 24-hour care attendant • Restorative therapies • Specialized rehabilitation services • Pharmacy services • Meals and dietary services • Medication administration • Routine assistive technologies/DME • Social services • Recreational therapy • Medical transportation	• Primary health care • Specialty health care • Diagnostic services • Hospital care • Dental care

LTC = Long Term Care; DME = Durable Medical Equipment

1. Restorative therapies typically include speech, physical, occupational, and/or respiratory therapies.
2. These services were added in late 2011, and thus, were only received by a small portion of study participants.
3. For elders residing in these LTC options, HCBS covers services that are comparable to in-home HCBS/FE services, as listed in this table. Customers must pay separately for additional costs, such as room and raw food costs.
4. As of 2010, these services are only available under crisis exception.

III. Beneficiary Profiles & Analysis

How do the characteristics of the beneficiary populations for each LTC option compare? The impact of the PACE program in Kansas was assessed by comparing expenditures and outcomes for PACE customers age 65 and older to HCBS and NF customers in the same age group. These are appropriate comparison groups, as HCBS/FE and NF would be common LTC alternatives for Medicaid customers if PACE were not a suitable option. Previous research has shown important differences between Medicaid beneficiaries in PACE, HCBS/FE, and NF settings. For this reason, it was important to carefully select study participants who were similar to one another. This report section reviews the criteria for matching participants, compares the profiles of the full Medicaid PACE, HCBS/FE, and NF populations, and discusses characteristics of the propensity score matched study population.

Beneficiary Profile Outline

Data Sources. Participant characteristics, used to select and match the samples, were identified through available LTC customer assessments. The common measure across all three populations was the Level of Care (LOC) threshold score, available through the PACE assessment, UAI (Uniform Assessment Instrument) for HCBS/FE customers, and CARE (Client Assessment, Referral, and Evaluation) form for NF customers. The LOC assessment is administered shortly before older Kansans begin receiving Medicaid LTC services and measures customer needs across several functional domains, as detailed in Box 1. The Medicaid Management Information System (MMIS) database was used to identify demographic information. The research team complied with and enforced Health Insurance Portability and Accountability Act (HIPAA) regulations for handling these confidential data.

Box 1: Measuring the Level of Care (LOC) Threshold Score

The LOC Threshold assessment is used to determine eligibility for Medicaid LTC services for older adults in Kansas. It considers functional status and care needs in the following areas:

Cognition

- Orientation to Time
- Word Recall
- Spelling Backwards
- Clock Draw

Activities of Daily Living (ADL)

- Bathing
- Dressing
- Toileting
- Transferring
- Walking/Mobility
- Eating

Instrumental Activities of Daily Living (IADL)

- Meal Preparation
- Shopping
- Money Management
- Transportation
- Telephone
- Laundry/Housekeeping
- Medication Management/Treatment

Risks

- Falls
- Neglect/Abuse
- Informal Support
- Behavior (wandering, socially inappropriate, decision making)

Matching Criteria. When identifying the study sample population, we considered several factors to match Medicaid customers in PACE with those in HCBS/FE and NF. A detailed discussion of decisions made regarding the matches is contained in the *Technical Addendum*, while a summary of key decisions is provided below.

Before matching, we first had to determine which Medicaid LTC customers were potentially eligible for inclusion in the study. The study was limited to Medicaid customers 65 and over who began LTC services between July 2006 and December 2011. Because PACE is available in eight counties in Kansas (listed on page 5), Medicaid HCBS/FE and NF participants were selected only from these counties. Medicaid customers were required to receive at least 90 days of service in either PACE, HCBS/FE, or NFs to be considered for matching to ensure adequate capture of program effect.

Additionally, because Medicaid customers may transition between these LTC programs, we had to determine which program would be considered their starting point. We chose to count only a customer's first *long* term experience in a program, and not count any prior *short* term stays in other programs. Thus, customers could not have received more than 60 days of service in one of the other Medicaid programs within six months prior to beginning their first long term stay of 90 days of more. To ensure LOC information was recent, potential participants also had to enroll in their respective Medicaid LTC program within 120 days of their assessment.

After identifying all eligible PACE, HCBS/FE, and NF customers, study participants were chosen using propensity score matching (PSM) based on demographic information and LOC scores. This method uses a calculated propensity score to match participants when it is not feasible to randomly assign participants to groups (see the *Technical Addendum* for further information). Demographic characteristics included age, gender, race, and county of residence. LOC threshold scores included Cognition, Activities of Daily Living (ADLs), Instrumental Activities of Daily Living (IADLs), and Risks (see Box 1).

Cognition, ADL, and IADL subcomponent scores were accounted for separately when calculating the propensity score for matching. For the risk component, we matched on availability of informal support and falls separately. Neglect and abuse was a rare event among the PACE sample, so we did not have sufficient numbers for propensity score matching on this criterion. We also excluded behavior risks when calculating the propensity score because these data were missing from many of the NF LOC records. We were unable to match participants according to diagnosis because this information was not available; however, previous research has established that functional capacities, such as ADLs and IADLs, which we did measure, are key in predicting LTC costs (Gaugler et al., 2007; Liu et al., 1997; Liu et al., 2000).

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Beneficiary Profiles at Baseline

Profile of Full Medicaid PACE, HCBS/FE, and NF Populations. To conduct a valid study of PACE Medicaid costs compared to other Medicaid LTC options, it was necessary to select HCBS/FE and NF customers who were similar to the PACE population (otherwise, we would expect the average customer in each of these Medicaid LTC care settings to differ with regards to LTC needs). Table 3 presents the profile for the full Medicaid LTC populations in this study before statistical matching was performed. We compared baseline data only – that is, participants' characteristics at the time they first accessed Medicaid LTC services. As described on page 6, Medicaid customers must have resided in the same counties served by the two PACE organizations, be age 65 or older, and spent at least 90 days in their respective program.

In summary, we found the average PACE customer to be similar to the average HCBS/FE customer, whereas the average NF customer's characteristics varied more significantly (see Table 3). The gender composition across all three groups was similar, with approximately 70% of customers being female and 30% male. The NF group was older with a mean age of almost 82 years, compared to 78 years for PACE and HCBS/FE customers. The racial profile was also significantly different, with the PACE program less likely to have Black customers and more likely to have Hispanic customers.

Before matching, we found that compared to PACE customers, the average HCBS/FE customer is very similar whereas the average NF customer's characteristics vary more significantly. On average, NF customers have greater cognitive, ADL, and IADL needs, and are much less likely to have informal supports available.

Of particular interest, we did not find any indications that the HCBS/FE population was significantly different from the PACE population in terms of ADL, IADL, and cognitive scores. On the other hand, the NF population had significantly higher needs in all areas. Considering the differences for ADL, IADL, cognition and informal support measures, it is not surprising that the average LOC score was significantly higher for the NF population (68.6), in contrast to PACE (51.5) and HCBS/FE (50.5) scores. Finally, the availability of informal supports was statistically different across groups, with 36% of NF customers, 63% of HCBS/FE customers, and 71% of PACE customers assessed as having informal supports available.

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Table 3: Average Customer Characteristics across Medicaid LTC Programs

			PACE[1] *n=136*	HCBS/FE[1] *n=1872*	NF[1] *n=1476*
Medicaid Customer Characteristics	**Age**	Mean	78.6	77.8	81.9***
		Range	65-97	65-102	65-105
	Gender[2]	% Female	71.3	71.5	67.6
		% Male	28.7	28.5	32.4
	Race	% White	74.3	60.2***	83.1***
		% Black	7.4	18.4***	9.6***
		% Hispanic	14.0	5.6***	3.3***
		% Other[3]	4.4	15.6***	4.1***
	Region	% Via Christi Service Area	58.9	65.2	55.2
		% Midland Service Area	41.2	34.8	44.8
	ADL	Mean	15.5	15.0	21.1***
		Range	0-48	0-48	0-48
	IADL	Mean	25.8	24.6	34.3***
		Range	11-52	6-52	0-52
	Cognitive	Mean	4.9	4.9	5.6***
		Range	0-8	0-8	0-8
	Falls, %		58.1	62.5	54.5
	Informal Supports, %		72.1	62.9*	36.4***
	Total LOC Score	Mean	51.5	50.5	68.6***
		Range	26-116	25-116	9-120

*Significant at: * p< .10, **p< .05, ***p<.01; Significantly different in comparison to PACE participants.*

1. Ages 65 and older, in eight counties served by PACE as listed on page 5, and at least 90 days in LTC program as a Medicaid customer. See *Technical Addendum* for additional details.
2. Percentages may not equal 100% due to rounding.
3. "Other" race includes Native American, Asian, and those originally defined as other.

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Matched Sample Characteristics at Baseline. The profile of the full PACE, HCBS/FE, and NF populations, described above, demonstrated important differences across these groups. Therefore, for the cost and benefit comparison of this study, we selected a sample of 680 similar participants (136 in PACE, and 272 each in HCBS/FE and NF) by matching them based on the criteria described above. This *two-to-one matching* method matches two HCBS/FE customers and two NF customers to each individual PACE customer. Two-to-one matching better controls for outlier expenditures and generally results in a more robust study by ensuring closer, more comparable matches than one-to-one matching techniques (Caliendo & Kopeining, 2008). The final study population represents approximately 15% and 18% of the qualifying HCBS/FE and NF populations, respectively, who most closely matched the selected PACE study participants.

Table 4 summarizes the characteristics of the matched study population. Most importantly, we successfully matched study participants based on age; race; region; ADL, IADL, and cognitive LOC scores; fall rates; and availability of informal social supports. As a result of successful matching on the LOC subcomponents, the total LOC score was also similar across all three groups. However, there was one statistically significant difference in our sample population – the NF sample had fewer females and more males compared to the PACE sample. Because the average NF population was quite different from the PACE population, matching on all criteria was difficult (see Table 3). Therefore, as informed by the literature (Liu et al., 1997), we determined that it was more important to match on age and functional status, rather than gender.

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Table 4: Study Participant Characteristics across Comparative Sample Groups

			PACE[1] n=136	HCBS/FE[1] n=272	NF[1] n=272
Study Participant Characteristics	**Age**	Mean	78.6	78.5	79.5
		Range	65-97	65-100	65-97
	Gender[2]	% Female	71.3	71.0	62.8*
		% Male	28.7	29.0	37.1
	Race	% White	74.3	67.7	79.0
		% Black	7.4	7.4	8.5
		% Hispanic	14.0	15.4	8.5
		% Other[3]	4.4	9.6	4.0
	Region	% Via Christi Service Area	58.8	59.6	51.1
		% Midland Service Area	41.2	40.4	48.9
	ADL	Mean	15.5	15.0	16.9
		Range	0-48	0-48	0-44
	IADL	Mean	25.8	25.2	26.7
		Range	11-52	6-52	10-52
	Cognitive	Mean	4.9	4.5	4.7
		Range	0-8	0-8	0-8
	Falls, %		58.1	59.6	59.6
	Informal Support, %		72.1	67.7	66.9
	Total LOC Score	Mean	51.5	50.5	54.1
		Range	26-116	26-113	26-112

*Significant at: * p< .10, **p< .05, ***p< .01; Significantly different in comparison to PACE participants.*

1. Medicaid customers only, ages 65 and older only, in eight counties served by PACE as listed on page 5, and at least 90 days in LTC program. See technical addendum for additional details.
2. Percentages may not equal 100% due to rounding.
3. "Other" race includes Native American, Asian, and those originally defined as other.

Summary

In our initial comparisons of customer characteristics, we found that PACE and HCBS/FE populations were highly similar, differing only on race and informal support domains, and that PACE and NF populations differed substantially on age, race, ADLs, IADLs, cognitive status, informal supports, and total LOC score. To construct similar groups in each LTC setting for comparison purposes, participants were successfully matched on key characteristics. In the next section, we discuss the findings of the cost and benefit analyses.

IV. Analysis of Costs and

How do Medicaid costs for PACE program customers to Medicaid costs for similar adults, aged 65 and older, served by HCBS/FE and NFs? The average costs for the matched participants are presented here in successive six-month increments between 2006 and 2011. In addition to cost comparisons, our benefit analyses included hospitalizations, emergency room (ER) visits, long term NF admissions, and mortality.

Methodology Overview

Project Timeline. This study tracked costs and benefits for matched customers enrolled in one of the three LTC programs between 2006 and 2011, beginning at the time of enrollment through death or the end of the study period, whichever came first. LTC customers who entered these programs prior to 2006 were excluded because LOC scores were calculated differently during that time and were incompatible with the more recent LOC scores. We began tracking costs at time of enrollment and ceased tracking costs and benefits when participants no longer received Medicaid benefits in Kansas. The study was limited to those enrolled in one of these LTC programs as a Medicaid customer for at least 90 days, as discussed in "Matching Criteria" in Section III of this report.

Because study participants entered these LTC programs at different points in time, it was not possible to track most participants over the full 5.5 year period. We analyzed average costs, at the aggregate level, over a four-year period and used the appropriate weights to adjust for varying lengths of time that individual customers spent in their respective Medicaid LTC program; these weights are further discussed in the *Technical Addendum*. We also conducted a longitudinal analysis of successive six-month increments over a four-year period. However, the sample size was too small to provide statistical power for significance testing in six-month intervals beyond the third year; therefore, we only reported results of the longitudinal costs analysis for three years. The benefits analyses (hospitalizations, ER visits, long term NF admissions, and mortality) were conducted at the aggregate level only; therefore, the weighted averages represent the entire period that study participants received Medicaid LTC.

Data Measures and Sources. Medicaid expenditures were gathered from the MMIS database. This database lists all expenditures by Medicaid recipient, type of service, and date. Expenditures are divided into the portion paid by Medicaid and the portion (if any) paid by the Medicaid recipient. This analysis included all expenses paid by Medicaid, but did not include participant obligations.

We calculated total expenditures at the aggregate level – that is, all study participants were grouped together within each LTC comparison group (PACE, HCBS/FE, and NF). We also considered subgroup differences across study participants with different baseline cognitive and ADL/IADL needs. Drawing on baseline LOC scores, the median cognition score and the median combined ADL/IADL score were used to classify study participants into subgroups (i.e., middle score of the total distribution defined the subgroups). All study participants with a cognition score of 0, 2, or 4 were classified into the "fewer cognitive needs" subgroup, and those with

scores of 6 or 8 were grouped into the "greater cognitive needs" subgroup. Study participants with a combined ADL/IADL score of 40 and below were classified into the "fewer ADL/IADL needs" subgroup, while those with a score of 41 and above were grouped into the "greater ADL/IADL needs" subgroup. The cognition subgroups did not take ADL/IADL scores into account and vice versa, as the small overall sample size did not allow for the creation of more sophisticated subgroups. Likewise, we were only able to divide these groups into "fewer" and "greater" subgroups using the median value as a cutoff.

Analyzed benefits included hospitalizations, ER visits, long term NF admissions, and mortality. We also attempted to compare changes in functional status over time, but ultimately found the data available for this type of analysis to be unreliable, as further detailed in the *Technical Addendum*. Hospitalizations were measured by frequency of admissions and days spent in hospital, as a per customer monthly average. ER visits were measured as frequency of visits, per customer per month. We tracked all ER events, including stand-alone ER visits and those leading to hospital admissions. Because the resultant monthly averages for hospital stays and ER visits were very small, we converted and reported these results as yearly averages.

Next, we tracked long term NF admissions for customers in PACE and HCBS/FE, per customer per month, over the entire study period. Long term NF admissions were defined as stays of 90 or more consecutive days in the NF, which is consistent with the literature (e.g. Fischer et al., 2003). We were unable to investigate short term NF admissions due to data limitations, as detailed in the *Technical Addendum.* We also examined the average length of time until NF admission, measured as the number of days from beginning PACE or HCBS/FE services until a study participant's first long term NF admission. Hospital, ER, and NF data were collected from the MMIS database for HCBS/FE and NF participants, and gathered directly from PACE sites for PACE customers. Finally, to measure mortality, we determined the proportion of study participants who died during the study period, based on death data from the MMIS database.

Analytical Procedures. For each participant, we extracted MMIS data. We summed the Medicaid expenditures by person and by week. Monthly averages are presented in the tables that follow. We tracked aggregate expenditures, as well as expenditures for those with differing cognitive and ADL/IADL needs, as further described below. We also tracked both aggregate and subgroup expenditures over time, so that short term and long term savings potential could be comparatively assessed.

An important consideration in completing the analysis was that Medicaid customers do not always remain in the same LTC program. For example, a PACE customer may leave the program and choose to become an HCBS/FE customer or an HCBS/FE customer may come to require NF care. In order to address these concerns analytically, the costs and benefits of PACE were only calculated for PACE customers who remained in PACE, as the State was specifically interested in whether the PACE program saved money and was less interested in expenditures for customers who had left PACE. On the other hand, we tracked costs and benefits for HCBS and NF customers, even as they switched LTC programs. As indicated in Section II of this report, a unique aspect of PACE is that it provides LTC in the home or in an NF under the same capitated rate. Whereas Medicaid costs increase when a HCBS/FE customer enters a NF, the

PACE program assumes these risks. Thus, to adequately capture and compare potential savings of the capitated PACE model, it was also important to track expenditures and benefits for HCBS/FE and NF study participants even as their type of care changed. Table 6 tracks the movement of study participants into different Medicaid LTC programs.

For statistical testing, PACE was the reference group to which we compared HCBS/FE and NF participant expenditures. We determined whether these expenditures were significantly different using t-tests to compare means. We reran many of the analyses excluding 5% of the outliers, and found the results were robust to outliers. Data were analyzed using SAS statistical software. Additional methodological details are available in the *Technical Addendum*.

Comparative Cost Analysis Results

Aggregate Costs. We compared average State Medicaid costs for similar PACE, HCBS/FE, and NF customers, over the study period, and found that PACE saved the State money compared to NFs, but not compared to HCBS/FE (see Table 5). Medicaid costs for HCBS/FE study participants were 17% lower than PACE costs, with an average difference of $320, per participant per month. On the other hand, there were substantial savings for PACE compared to NFs, with NF costs averaging $1,136, or 62%, greater than PACE costs, per participant per month. Although average PACE costs were consistently greater than HCBS/FE costs, the expenditure gap narrowed over time. During months 25-30, the PACE-HCBS/FE cost differential was small and insignificant. Average NF spending was significantly and substantially higher than PACE spending throughout all time points, and savings did increase over time. In the following tables, "Month 1" is the first month participants were enrolled in their respective program, and so these indicate different calendar months for each participant.

Table 5. Average Medicaid Costs across Groups over Time

	Average Medicaid Costs over Time; Per Participant per Month						
	Months 1-6	**Months 7-12**	**Months 13-18**	**Months 19-24**	**Months 25-30**	**Months 31-36**	**4-Year Average[1]**
PACE	$1,930	$1,883	$1,810	$1,815	$1,762	$1,767	$1,832
n	136	116	87	68	54	38	
HCBS/FE	$1,194***	$1,589*	$1,502***	$1,640*	$1,743	$1,566*	$1,512***
n	272	233	181	150	115	91	
NF	$2,711***	$2,943***	$3,022***	$3,032***	$3,082***	$3,286***	$2,968***
n	272	219	175	131	95	78	

*Significant at: *p< .10; **p< .05; ***p< .01; Significant difference compared to PACE costs during same timeframe*

1. The four-year average and six-month increments are weighted to account for various lengths of time that customers spent in their respective Medicaid LTC program.

We found that less than 4% of study participants left PACE or HCBS/FE while on Medicaid and less than 1% of NF study participants left this program, as shown in Table 6. The longitudinal cost analysis was limited to three years, primarily due to participant attrition. Medicaid participants entered these programs at different times and those who entered later did not have data available for the entire study period, which is represented as the "End of Time in Study" category in Table 6. Death was also a common reason for attrition. Patterns of switching Medicaid programs and attrition are further detailed in the *Technical Addendum*.

Table 6. Study Participants Final Status

			End Point[1]	
			#	%[2]
Starting Point	PACE n=136	PACE	28	20.6
		Other Medicaid	5	3.7
		Deceased	35	25.7
		End of Time in Study[3]	55	40.4
		Unknown[4]	13	9.6
	HCBS/FE n=272	HCBS/FE	59	21.7
		Other Medicaid	9	3.3
		Deceased	69	25.4
		End of Time in Study	105	38.6
		Unknown	30	11.0
	NF n=272	NF	62	22.8
		Other Medicaid	2	0.7
		Deceased	110	40.4
		End of Time in Study	83	30.5
		Unknown	15	5.5

1. End of Month 36
2. Percentages may not equal 100% due to rounding.
3. "End of Time in Study" delineates customers who participated in the programs less than the full 36 months, which is not due to death or disenrollment.
4. "Unknown" includes people who no longer have Medicaid records from Kansas, which is not due to death.

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Subgroup Costs. We conducted subgroup analyses to determine whether Medicaid costs varied by functional need. Subgroup analyses based on cognitive needs are reported below in Tables 7 and 8. Across study participants with fewer cognitive needs, the Medicaid cost differential between PACE and HCBS/FE was higher than aggregate averages, with an average per participant per month PACE cost of $578 more than HCBS/FE. However, the cost differential disappears when comparing PACE and HCBS/FE study participants with greater cognitive needs. These PACE customers were more expensive during the first six months, but the difference was not significant in subsequent time periods, and the four-year weighted average was very similar. Costs were substantially and significantly higher for NF study participants compared to PACE participants for both cognitive subgroups.

Table 7. Average Medicaid Costs across Study Participants with Fewer Cognitive Needs[1]

	Average Medicaid Costs over Time; Per Participant Per Month			
	Months 0-6	Months 7-12	Months 13-18	4-Year Average[2]
PACE	$1,938	$1,883	$1,852	$1,880
n	70	58	44	
HCBS/FE	$1,111***	$1,274***	$1,277***	$1,302***
n	148	123	99	
NF	$2,676***	$2,798***	$2,903***	$2,911***
n	139	114	97	

*Significant at: *p< .10; **p< .05; ***p< .01; Significant difference compared to PACE costs during same timeframe.*

1. Fewer cognitive needs include LOC cognition scores of 0, 2, or 4.
2. The four-year average and six-month increments are weighted to account for various lengths of time that customers spent in their respective Medicaid LTC program. Four-year averages may be greater than averages during the first 18 months, as costs increased over time. Due to sample attrition, we could no longer determine statistical significance when examining 6-month increments after the 18 month point.

Table 8. Average Medicaid Costs across Study Participants with Greater Cognitive Needs[1]

	Average Medicaid Costs over Time; Per Participant Per Month			
	Months 0-6	Months 7-12	Months 13-18	4-Year Average[2]
PACE	$1,920	$1,883	$1,769	$1,786
n	66	58	43	
HCBS/FE	$1,288***	$1,948	$1,778	$1,783
n	124	110	82	
NF	$2,748***	$3,114***	$3,171***	$3,044***
n	133	105	78	

*Significant at: *p< .10; **p< .05; ***p< .01; Significant difference compared to PACE costs during same timeframe.*

1. Greater cognitive needs include LOC cognition scores of 6 or 8.
2. The four-year average and six-month increments are weighted to account for various lengths of time that customers spent in their respective Medicaid LTC program.

The subgroup analyses of Medicaid LTC study participants with different ADL/IADL needs produced similar results, as shown in Tables 9 and 10 below. The cost differential between PACE and HCBS/FE participants with fewer ADL/IADL needs was significant, with PACE costing an average of $610 more than HCBS/FE, per participant per month. The cost differential during Months 7-12 was not found to be statistically significant. Across PACE and HCBS/FE participants with greater ADL/AIDL needs, HCBS/FE costs were initially lower, but expenditures were similar overall. PACE was substantially and significantly less expensive than NFs for both ADL/IADL groups at all points in time, by an average of greater than $1,000 per participant per month.

Table 9. Average Medicaid Costs across Study Participants with Fewer ADL/IADL Needs[1]

	Average Medicaid Costs over Time; Per Participant Per Month			
	Months 0-6	**Months 7-12**	**Months 13-18**	**4-Year Average[2]**
PACE	$1,977	$1,920	$1,851	$1,856
n	75	64	45	
HCBS/FE	$905***	$1,486	$1,229***	$1,246***
n	139	118	93	
NF	$2,697***	$2,863***	$3,000***	$2,952***
n	105	91	77	

*Significant at: *p< .10; **p< .05; ***p< .01; Significant difference compared to PACE costs during same timeframe*

1. Fewer ADL/IADL needs include combined ADL and IALD LOC scores of 40 and below.
2. The four-year average and six-month increments are weighted to account for various lengths of time that customers spent in their respective Medicaid LTC program.

Table 10. Average Medicaid Costs across Study Participants with Greater ADL/IADL Needs[1]

	Average Medicaid Costs over Time; Per Participant Per Month			
	Months 0-6	**Months 7-12**	**Months 13-18**	**4-Year Average[2]**
PACE	$1,871	$1,839	$1,766	$1,802
n	61	52	42	
HCBS/FE	$1,483***	$1,697	$1,812	$1,819
n	133	115	88	
NF	$2,720***	$3,002***	$3,038***	$2,981***
n	167	128	98	

*Significant at: *p< .10; **p< .05; ***p< .01; Significant difference compared to PACE costs during same timeframe.*

1. Greater ADL/IADL needs include combined ADL and IADL LOC cores of 41 and above.
2. The four-year average and six-month increments are weighted to account for various lengths of time that customers spent in their respective Medicaid LTC program. Four-year averages may be greater than averages during the first 18 months, as costs increased over time. Due to sample attrition, we could no longer determine statistical significance when examining 6-month increments after the 18 month point.

Three Months Before-Death Costs. Finally, we examined aggregate costs for the three-month period before death, as shown in Table 11. In general, health care costs tend to increase substantially during the period shortly before death (Bernato, et al, 2004; Liu, et al, 1997; Yu, 2008). Because the capitated PACE payment remains consistent throughout a customer's lifetime, PACE is expected to help curtail health care costs in the period before death. Our analysis demonstrated that this is indeed the case. Compared to PACE study participants, HCBS/FE before death costs were $3,907 higher (42%) and NF before death costs were $2,594 higher (33%). This finding suggests the critical importance of tracking Medicaid expenditures through death for all study participants to better understand how these end-of-life savings impact overall average expenditures in comparison to the other LTC programs. Throughout this study, approximately 25% of PACE study participants, 25% of HCBS/FE participants, and 40% of NF participants died, as indicated in Table 6 above.

Table 11: Medicaid Expenditures across Study Participants, Three Months before Death

	Medicaid Costs, Three Month Total
PACE n=37	$5,179
HCBS/FE n=86	$9,086*
NF n=134	$7,773***

*Significant at: *p< .10; **p< .05; ***p< .01; Significant difference compared to PACE costs during same timeframe.*

Health Outcomes and Benefits Analysis

This section presents analyses of non-monetary outcomes, including hospitalizations, ER visits, long term NF admissions, and mortality risks; and assesses whether these outcomes varied between PACE study participants and HCBS/FE and NF study samples.

Hospitalizations. We found that PACE, HCBS/FE, and NF study participants were equally likely to be admitted to the hospital, although PACE participants spent fewer days in the hospital (see Table 12). Study participants across all three groups were admitted to the hospital less than one time per year, on average. PACE participants spent an average of three days in the hospital per year, compared to nearly five days for HCBS/FE and NF participants.

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Table 12. Risk of Hospital Stay by Comparative Sample Groups

	Hospitalizations; Per Participant Per Year	
	Number of Admissions	Number of Days
PACE n=136	0.60	2.64
HCBS/FE n=272	0.73	4.53***
NF n=272	0.78	4.99***

*Significant at: ***p< .01; Significant difference compared to PACE costs.*

ER Admissions. We found that PACE study participants were as likely as HCBS/FE and NF participants to visit the ER, as no statistically significant differences were found (see Table 13). Participants with incomplete ER records were excluded from this analysis (see *Technical Addendum*). Although this resulted in a smaller sample of PACE participants, we retained a sufficient sample size to statistically power significance testing. Study participants across all three Medicaid programs visited the ER less than once annually per person, on average.

Table 13. Frequency of Emergency Room Visits by Comparative Sample Groups

	ER Visits; Per Participant Per Year
PACE n=80	0.68
HCBS/FE n=272	0.74
NF n=272	0.66

Long Term NF Risks. A similar proportion of PACE and HCBS/FE study participants experienced a long term NF admission, as well as similar lengths of time until admission (see Table 14). For both study populations, the risk of long term NF admission was low, with only 15% of either population experiencing a long term admission. Furthermore, for those who did experience long term NF stays, PACE customers averaged 411 days until admission and HCBS/FE customers averaged 502 days until admission, indicating that both populations received community-based LTC services for over a year on average before long term NF care was sought.

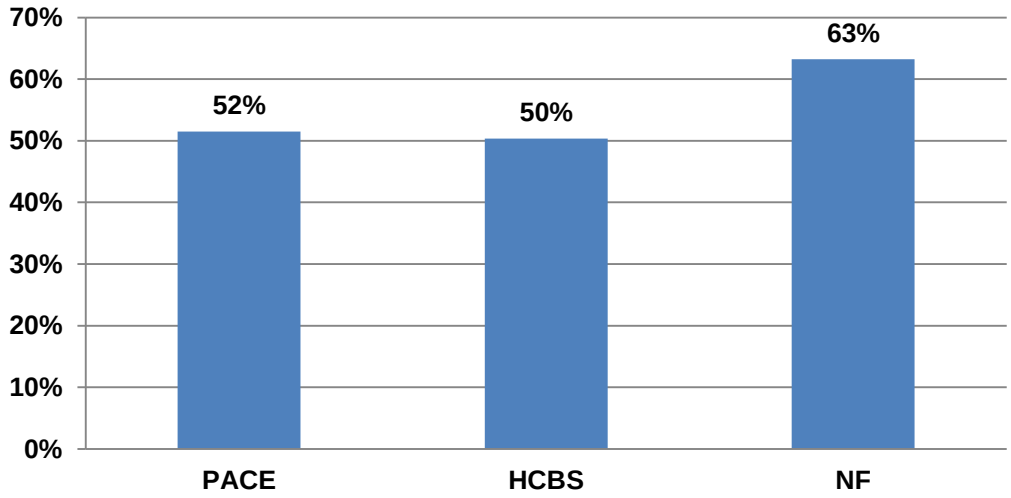
Table 14. Long Term NF Stays[1] for PACE and HCBS/FE Study Participants

	Long Term NF Stays	
	Admissions	**Average Days Until Admission**
PACE n=136	15.44% n=21	411
HCBS/FE n=272	15.07% n=41	502

1. Long term stays are defined as 90 days or more.

Mortality. Mortality risks were similar for PACE and HCBS/FE, but markedly higher for NF study participants, as shown in Figure 1. Additional analysis revealed that NF study participants had higher mortality at all points in time, as further detailed in the *Technical Addendum*. This higher NF mortality may be reflective of risk differences and/or effects of institutionalization. Higher mortality among NF study participants suggests there may be important differences between our PACE and NF study sample, as further discussed in the conclusion.

Figure 1: Cumulative Mortality across PACE, HCBS/FE, and NF Study Participants[1]



1. Cumulative mortality is measured at 36 months after program enrollment. Study participants who reached the end of the study period before three full years passed were not included in this analysis.

Summary

Medicaid spending for PACE study participants was found to be significantly higher than spending for similar HCBS/FE participants, but significantly lower compared to similar NF participants:

- PACE Medicaid expenditures were about 20% higher than expenditures for similar HCBS/FE customers, costing an average of $320 more per participant per month over a four-year weighted aggregate period.
- Although PACE cost more than HCBS/FE, on average, Medicaid expenditures were similar when comparing costs for participants with greater cognitive needs and greater ADL/IADL needs.
- Medicaid spending was lower for PACE study participants in comparison to NF participants, saving over $1,000 per participant per month on average. Savings were evident at all time points, regardless of cognition or ADL/IADL level.
- PACE Medicaid expenditures were significantly lower than both HCBS/FE and NF study participants during the three-month period before death. PACE before-death costs were 43% lower than HCBS/FE costs and 33% lower than NF costs (saving $3,907 and $2,594, respectively).

Health care outcomes did not differ greatly across the three groups for hospitalizations, ER visits, and long term NF admissions, although the following benefits were documented:

- Although PACE study participants were admitted to the hospital as often as similar HCBS/FE and NF study participants, PACE customers spent significantly fewer days in the hospital.
- Both PACE and HCBS/FE study participants experienced low rates of long term NF admissions. Most of the 15% of participants who eventually entered an NF remained in the community for more than one year before requiring long term NF care. This suggests that both programs are effective in reducing and delaying NF utilization and increasing community tenure.
- PACE and HCBS/FE study participants experienced similar mortality. Higher mortality among NF study participants may indicate differences across our study population samples that we were unable to capture using the propensity score matching technique with the measures available.

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V. Discussion and Conclusion

How do Kansas Medicaid expenditures for PACE compare to expenditures for HCBS/FE and NFs?

PACE Medicaid expenditures were similar to those for HCBS/FE customers with greater functional needs, and less for customers near the end of life. However, Medicaid expenditures for HCBS/FE customers were lower on average for the entire matched PACE sample over a four-year weighted aggregate period. PACE Medicaid expenditures were significantly less than those for NF, across all time periods, regardless of functional needs.

Cost-Benefit Discussion

We found that, during our study period, PACE was a cost-effective, community-based alternative for clients with higher levels of cognitive and ADL/IADL impairments. However, for matched customers in the aggregate, Medicaid PACE costs were higher than those for HCBS/FE. Yet, it is important to note that there may be additional savings from PACE compared to HCBS/FE at the very end of life, which were not thoroughly captured in our study time frame. Compared to similar NF customers, PACE cost the State less in all circumstances. These findings are similar to recent published literature (Foster et al., 2007; Mehdizadeh et al., 2012; Mancuso, Yamashiro, & Felver, 2005; White, Abel, & Kidder, 2000) and provide important insights for State policymakers as they consider expanding PACE.

In general, the literature demonstrates that PACE saves federal Medicare dollars, but not State Medicaid dollars. In a similar study, Mehdizadeh and colleagues indicate that PACE's focus on preventative care is more advantageous to Medicare than Medicaid, as Medicare has greater responsibility for acute health care costs and Medicare capitated payments are adjusted for acuity. Thus, if a PACE customer experiences a substantial condition improvement, Medicare payments are reduced, whereas Medicaid payments remain the same. For this reason, Mehdizadeh and colleagues recommended that the State of Ohio renegotiate the federal-state cost sharing arrangement. Likewise, a recent report on Medicaid in Kansas recommended a shared savings model for dually-eligible LTC customers (Deloitte, 2011). Our findings that PACE does not save Medicaid dollars compared to HCBS/FE provides additional support for the need to reconfigure the federal-state cost-share formula. We recognize that a new cost sharing formula for PACE is a large systemic change that cannot be implemented by Kansas alone; however, perhaps in collaboration with other states, further information can be gathered and steps can be taken in this direction.

Our Medicaid LTC beneficiary profile analysis, reported in Section II, demonstrates that current PACE customers are quite similar to HCBS/FE customers, but are less impaired than average NF customers, prior to matching. This indicates that PACE currently operates as more

of an alternative for the HCBS/FE program than for the NF program. Nonetheless, in matching study participants, we identified NF customers with levels of cognitive and functional impairment similar to PACE customers. In order to be enrolled in PACE, Medicaid LTC customers must be able to reside safely in the community with adequate support, indicating PACE is not a suitable alternative for *all* NF customers. However, efforts to identify NF customers who can thrive in the community with PACE's wraparound supports are supported by these results.

Conversely, PACE services may not be the most cost effective option for Medicaid LTC customers with few or moderate LTC needs. In reviewing HCBS/FE service utilization among our study participants, we observed a substantial minority of customers who went months without using any HCBS/FE supports. This indicates that despite being eligible for NF care, many HCBS/FE customers are able to continue residing in the community with minimal formal LTC supports. This is consistent with previous OALTC research, where we found that some HCBS/FE customers use services for a relatively short time, typically after a health care crisis, and then may not use services for an extended period of time or may never use services again (Chapin et al., 2009). In this respect, the fee-for-service HCBS/FE model is more flexible, because Medicaid is not incurring expenses when services are not utilized. Therefore, with PACE, as well as other LTC capitated approaches, the State does not reap the savings they currently realize when HCBS/FE customers access services for only a limited amount of time and then no longer receive publicly-funded long term care services.

PACE Medicaid expenditures were lower than both HCBS/FE and NF customers during the three-month period before death, saving $3,907 and $2,594, respectively. Throughout our study period, approximately 25% of PACE study participants, 25% of HCBS/FE study participants, and 40% of NF study participants died. However, the before-death cost savings suggests a need to track *all* participants through death to investigate whether these savings balance the higher costs of PACE compared to HCBS/FE during earlier time periods. The potential of capitated programs to save money before death also illustrates a need to ensure that such programs keep their customers enrolled through death. The PACE model includes incentives to encourage coverage through end-of-life, including a requirement that PACE organizations cannot disenroll customers. Customers can choose to leave PACE in their final days, but this is potentially discouraged through advance directive counseling and end-of-life palliative care included in the PACE care package.

Health care outcomes did not differ greatly across the three groups for hospitalizations, ER visits, and long term NF admissions, although some benefits were documented. Hospitalization frequency was similar across all three groups, but PACE study participants experienced shorter hospital stays overall. We cannot definitively determine why PACE customers had shorter stays, but the PACE model of care suggests some possible reasons. In this all-inclusive model, PACE customers receive routine monitoring of health conditions. Therefore, it is possible that conditions requiring hospital care are identified earlier, leading to better treatment outcomes and shorter hospital stays. Furthermore, PACE sites have a financial incentive to limit lengthy hospital stays, as they are responsible for all hospital charges.

Approximately 15% of both PACE and HCBS/FE study participants experienced long term NF admissions. Although our findings contrast with a national study that found lower NF rates for PACE customers compared to HCBS/FE customers (Chatterji et al. 1998), the NF

admission rate we found is consistent with national PACE data (Freidman et al 2005). Given that all PACE and HCBS/FE customers are eligible for NF care, these low percentages indicate that for customers in both programs, long term NF utilization is reduced or delayed, thus increasing community tenure.

Finally, the NF study population had a greater proportion of individuals who died throughout the study period, compared to the PACE and HCBS/FE groups. We cannot determine if this is due to differences across the study populations (i.e., risk differences) or an effect of the program itself. In regards to risk differences, although the higher LOC score for the NF study population was not statistically significant, it is possible that this higher score partially explains the higher mortality for the NF group. We were also unable to statistically match participants on diagnoses and there are undoubtedly other unmeasurable differences across the sample populations. A similar study conducted in the State of Washington also found a large discrepancy between PACE and NF mortality risks, and concluded that this may be due to risk differences that were not captured by the study design (Mancuso, Yamashiro, & Felver, 2005). This suggests some caution in interpreting the cost savings found for PACE compared to NF, as it is possible that NF participants had greater needs than those we could ascertain with the available data.

In the course of completing our research, we gained insights that can be helpful as the State considers expanding PACE. Expansion efforts may be improved if the State investigated and addressed barriers to expansion, including enrollment and retention issues, and difficulties in providing services in rural areas. The current PACE service area is substantially more urban than the rest of Kansas. We calculated rurality levels for PACE counties, using the USDA Urban Influence Codes, a scale of 1-12 where 12 is most rural. We found that PACE counties averaged a score of 2, compared to an average of 9 for the remaining Kansas counties. Further, older adults in Kansas are more likely to reside in rural areas (15.4%) than in urban areas (12.3%) (U.S. Census, 2010). It is generally difficult to meet the LTC and health care needs of rural-based older adults (National Advisory Committee on Rural Health and Human Services, 2004); yet, PACE programs have been successfully established in rural regions in other states (Anderson, 2011). Systematic investigation of the experiences of other States in creating rural PACE programs could be helpful to Kansas policymakers. If PACE were expanded to less urban areas, cost outcomes may differ.

PACE expansion efforts may be improved if the State further investigates and addresses enrollment and retention challenges, as well as examines other state's strategies for offering PACE services in rural areas.

The referral process also needs further research to better understand factors influencing access to and enrollment in PACE and customer decision-making processes. Our analysis of LTC trajectories among study participants found few Medicaid customers switched sources of LTC (see Section IV, Table 6), thus supporting informed decision-making among Medicaid customers seeking community-based LTC. However, the PACE enrollment forms we reviewed indicated delays of up to four months from PACE application to actual enrollment, whereas NF care was more immediate. It is possible that this lag time discouraged potential PACE customers from actually completing their enrollment. An expedited service delivery process

could help eliminate such delays and increase enrollment rates. We also found that some PACE customers disenrolled to receive NF care outside of the PACE network, resulting in lost savings to the State. To maximize the savings potential of PACE, it would be instructive to analyze reasons for and patterns of disenrollment so that issues related to retention could be addressed.

Study Limitations

Some research questions could not be addressed by this study due to data limitations, such as reduced sample size, missing data, and data inconsistencies across the study populations. We summarize these issues below and further describe them in the *Technical Addendum*. We were unable to perform longitudinal cost analyses and in-depth examinations of subgroups for the three LTC programs beyond three years due to sample size issues. Sample size issues also influenced our ability to analyze subgroups in more depth across participants with varying ADL/IADL and cognitive needs. Moreover, as addressed above, we were unable to track costs for *all* participants through death. Future research should more thoroughly capture end-of-life costs in order to more definitely evaluate Medicaid cost savings between PACE and other LTC customers. An important consideration in interpreting our findings is that we were unable to match participants based on diagnoses or mental health needs. We also faced challenges with missing ER data from PACE sites, which reduced our sample size for analysis. Furthermore, without access to Medicare data, we were unable to identify short term NF stays. Finally, we were unable to compare changes in functional capacities across PACE, HCBS/FE, and NF customers because of LOC threshold score reassessment data inconsistencies.

Our ability to compare non-monetary benefits and outcomes was limited by availability of these measures in MMIS. We examined hospitalizations, ER visits, long term NF admissions, and mortality. While these are all important health care outcome indicators, they do not completely capture many potential benefits that may arise from integrated care. Other research has demonstrated that PACE customers have fewer unmet needs (Beauchamp et al., 2008). For example, previous OALTC research has documented challenges that prevent older adults from receiving effective mental health treatment and that this can be a barrier to successful community tenure (Chapin et al., 2009,2010). Because mental health treatment is provided directly by PACE sites, documented barriers, such as lack of providers, transportation, and stigma related to going to a mental health center, may be surmounted. However, further research would be needed to document this outcome.

Many of the data issues we experienced when conducting our benefits analysis were related to the nature of comparing a capitated program to fee-for-service programs. The MMIS database provided a very rich and reliable source of data on service usage for fee-for-service Medicaid customers in HCBS/FE and NFs. However for PACE customers, the monthly capitated payments were the only data available in MMIS. We gathered service usage data for PACE study participants directly from PACE sites. Although PACE staff were willing and helpful, the process of acquiring these data was arduous and expensive. In addition to missing data, some data were not always useful because measures were not defined consistently over time or across PACE sites. This experience may be helpful to the State as they transition Medicaid into

primarily a capitated program. If the State is proactive in thinking about the type of service usage and health data that will be critical in maintaining program accountability and measuring outcomes, it is more likely that such data will be collected in a systematic and standardized way across all organizations administering Medicaid benefits in the State of Kansas.

Our results are only generalizable for Medicaid expenditures for PACE, HCBS/FE, and NF customers in the State of Kansas. As reimbursement rates are set separately by each state, comparative expenditures will vary in other locations. Furthermore, the results of the Kansas PACE Medicaid Cost-Benefit Study only apply to the PACE program, and not to other health maintenance organizations (HMOs), managed care organizations (MCOs), or capitated programs in Kansas. Although PACE is a capitated, managed care benefit for Medicare and/or Medicaid customers, it is not a traditional MCO because PACE organizations provide most care directly, rather than through contracts (CMS, 2011; Medicare/Medicaid Dual Eligibles, 2011). The integrated care model provides the interdisciplinary PACE team with an intimate knowledge of their customers' LTC and health care needs.

Finally, we only tracked and compared Medicaid expenditures paid to LTC and other health care providers for actual services rendered. We did not analyze costs related to State administration of these programs. In theory, capitated programs should have fewer administrative costs, but additional research is needed to verify. Additionally, we did not include Medicaid payments made to cover Medicare premiums, as these expenditures were not available in the MMIS database. However, the Medicare premium amount is equivalent across all three study populations, and therefore, does not impact our comparative cost findings. OALTC staff are available to further discuss expansion barriers, strategies, and other issues outlined above.

Conclusion

Overall, results from the beneficiary profiles, cost analysis, benefits analysis, and cost-benefit summary in this study provided new information that can be used to inform policy decisions regarding Medicaid, PACE, and other LTC programs in Kansas. Because we were able to match the three groups closely on specific characteristics and longitudinally track them over a three-year period, we are confident our research design and analyses have produced findings that are valid, reliable, and generalizable across the State of Kansas. However, the timeframe and sample size limited our ability to follow all customers through their final days of life.

This study provides important insights into challenges faced when attempting to determine the cost effectiveness and outcomes of capitated systems. We were able to determine that PACE Medicaid expenditures were similar to those for HCBS/FE customers with greater functional needs, and less for customers at the end of life; yet, we were unable to examine differences in functional outcomes because PACE sites did not document this information in a uniform manner. Further, PACE data were not always directly comparable to data for NF and HCBS/FE consumers. Although Medicaid expenditures for HCBS/FE customers were lower on average for the entire matched PACE sample over a four-year weighted aggregate period, we could not determine whether PACE program consumers had superior

functional outcomes. Capacity to assess functional outcomes in a uniform way across programs is critical to effective program evaluation.

The capacity to analyze service utilization, costs, and health outcomes is essential as the State continues to explore ways to develop a cost-effective LTC system. Our study offers valuable comparative findings on the costs of three LTC options currently available for elderly Kansans enrolled in Medicaid – PACE, HCBS/FE, and NFs. Our study also provides practical information and guidance for the monitoring and future evaluation of these key programs.

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