Senior and Persons with Disability Use of California's LTSS Programs

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Prepared for

The California Department of Health Care Services

June 30, 2016

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Acknowledgments

This report is supported by funds received from the California Department of Health Care Services - DHCS Contract# 15-92176. The authors wish to acknowledge the contributions of the Research and Analytical Studies Branch within the California Department of Health Care Services in preparing some of the data files used for this study. We would also like to thank Lena Libatique for assisting with the formatting and copy editing of this report.

CAMRI

CAMRI is a multi-campus research program of the University of California that promotes the development and dissemination of evidence to improve policy decision-making in California's Medicaid program. For more information, please visit http://camri.universityofcalifornia.edu/.

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INTRODUCTION

Total US Medicaid spending was $498.3 billion in fiscal year 2014, an 8% increase over the previous year, and a growing proportion of spending (38%) was for managed care capitation spending.[1] California spent $68.2 billion (including federal and state funds) on its Medi-Cal program (California's name for Medicaid) in 2014, about 25.1% of the state's total budget, and more than its expenditures on elementary and secondary education (21.4% of state expenditures).[2]

Those who use long-term services and supports (LTSS), including nursing facilities (NF) and home and community based services (HCBS), are among the most costly participants in the Medicaid program nationally. For FY 2014, Medicaid spent $55.8 billion nationally on fee-for-service HCBS, or 11.9% of its total spending.[3] In addition, Medicaid spent $65.7 billion, or 13.8%, on fee-for-service institutional services, for a total of $121.5 billion on LTSS in 2014.[3] Medicaid beneficiaries who use LTSS tend to have multiple chronic health conditions, as well as limitations in activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Of the total Medicaid enrollees nationally, 6.2% used LTSS in 2012. Their spending was 43.4% of the total Medicaid spending in that year.[4]

Nationally, Medicaid enrollee spending for those who were dually eligible for Medicare and Medicaid was 37.2% of total spending in 2012, while children's spending was 18.6% of the total. The remainder (44.2%) of spending was for Medicaid-only eligible individuals who were aged, disabled, or adults.[5] This report focuses on the Medicaid-only seniors and persons with disabilities in California.

BACKGROUND

Of concern for California policymakers is that the average annual Medicaid expenditures for HCBS recipients are about half those of nursing facilities recipients.[6,7] Earlier studies have found that this differential may be attributable to greater levels of disease burden and other limitations among those receiving LTSS.[8] However, there is variation among counties in the relative use of HCBS versus nursing facility use. Several cross sectional studies have found that the setting in

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[1] Medicaid and CHIP Payment and Access Commission. Exhibit 16. MACSTATS: Medicaid and CHIPS Data Book. December 15, 2015, https://www.macpac.gov/publication/macstats-medicaid-and-chip-data-book-2/.

[2] Medicaid and CHIP Payment and Access Commission. Exhibits 5 and 16. MACSTATS: Medicaid and CHIPS Data Book. December 15, 2015. https://www.macpac.gov/publication/macstats-medicaid-and-chip-data-book-2/.

[3] Medicaid and CHIP Payment and Access Commission. Exhibit 17. MACSTATS: Medicaid and CHIPS Data Book. December 15, 2015. https://www.macpac.gov/publication/macstats-medicaid-and-chip-data-book-2/.

[4] Medicaid and CHIP Payment and Access Commission. Exhibit 20. MACSTATS: Medicaid and CHIPS Data Book. December 15, 2015, Medicaid and CHIP Payment and Access Commission. https://www.macpac.gov/publication/macstats-medicaid-and-chip-data-book-2/.

[5] Medicaid and CHIP Payment and Access Commission. Exhibit 21. MACSTATS: Medicaid and CHIPS Data Book. December 15, 2015. https://www.macpac.gov/publication/macstats-medicaid-and-chip-data-book-2/.

[6] Eiken S, Stredl K, Gold L, et al. Medicaid Expenditures for Long Term Services and Supports; 2011. Cambridge, MA: Truven Health Analyses, 2013

[7] Kaiser Commission on Medicaid and the Uninsured. Medicaid's Long Term Care Users: Spending Patterns Across Institutional and Community-Based Settings. Palo Alto, CA: Kaiser Family Foundation. http://www.kff.org/medicaid/7576.cfm.2011

[8] Liu K, Long SK, Aragon C. Does health status explain higher Medicare costs of Medicaid enrollees? *Health Care Financing Review*, 1998, 20:39-54.

which long-term care is delivered, the community versus a nursing facility, is associated with the subsequent use of acute care services, most specifically hospitalizations. Specifically, studies have shown that hospitalization rates are higher for those receiving long-term care in a nursing facility than in the community.[9] Others have reported that while total health care expenditures may be higher, the difference is primarily related to the cost of long-term care, and that acute care spending is actually lower for those cared for in nursing facilities as compared to in the community.[10] Conflicting findings such as these have led our research team to examine the health care utilization patterns of Medicare and Medicaid enrollees (MMEs) before and after initiating long-term care in the community or in a nursing facility in California. Using administrative data, we found that MMEs admitted to a nursing facility (NF) for long-term care had much greater use of hospitalizations, ED visits, and post-acute care before initiating long-term care than those entering long-term care in the community. Post-entry, community service users had less than half the average monthly hospital and ED use compared to the NF cohort.[11] Recognizing that these outcomes may in part be attributed to better health and functional status among those living in the community, we conducted a second analysis using propensity score methods to control for these possible differences in the characteristics of Medicare and Medicaid enrollees using HCBS compared to nursing facility services. We showed that those initiating extended nursing facility care had higher monthly healthcare expenditures compared to those who initiated HCBS, even after controlling for demographic, health, and functional characteristics of the individuals. The difference in costs was driven by higher costs of delivering LTSS in nursing facilities rather than in the community, and these expenditures were not offset by lower acute (e.g. hospital and ED) and post-acute care spending.[12]

However, our study examined only dually eligible Medicare and Medicaid enrollees in California. The current report examines LTSS use for Medi-Cal Seniors and Persons with Disabilities (SPD) enrollees who are not eligible for Medicare.

This is part of a DHCS effort to respond to the need to shift the delivery of LTSS to more appropriate and less costly settings. Since 2014, California has been pursuing greater integration of LTSS with acute and post-acute care services through the Coordinated Care Initiative (CCI). A key component of this initiative is the consolidation of LTSS programs into a managed care modality. This is commonly referred to as Managed LTSS or MLTSS. SPDs who are eligible for Medicaid, receiving LTSS, and residents of CCI counties are enrolled in MLTSS. Managed care for LTSS is expected to offer incentives to health plans to ensure admissions to nursing facilities when needed, and that enrollees have every appropriate opportunity to receive

[9] Bogaisky, M. & Dezieck, L. (2015). Early hospital readmission of nursing home residents and community-dwelling elderly adults discharged from the geriatrics services of an urban teaching hospital: patterns and risk factors. Journal of the American Geriatrics Society. 63(3):548-52, doi:10.1111/jgs/13317; Segal, M., Rollins, E. Hodges, K., & Roozeboom, M. (2014). Medicare-Medicaid eligible beneficiaries and potentially avoidable hospitalizations. *Medicare & Medicaid Research Review,* 4, E1-E10, doi: 10.5600/mmrr.004.01.b0

[10] Kane RL, Wysocki A, Parashuram, et al. Effect of long-term care use on Medicare and Medicaid expenditures for dual eligible and non-dual eligible elderly beneficiaries. *Medicare Medicaid Res Rev* 2013; 3(3):E1-E22.

[11] Newcomer R, Harrington C, Hulett D, Kang Ko M, Bindman A. Health Care Use Before and After Entering Long Term Services and Supports. *Journal of Applied Gerontology* (published online April 17, 2016 as doi:10.1177/0733464816641393

[12] Newcomer R, Ko M, Kang T, Harrington C, Hulett D, Bindman A. Health care expenditures after initiating long-term services and supports in the community versus in nursing facility. *Medical Care,* 54(3):221-228

LTSS in home and community settings when accordance with enrollee needs and preferences.[13]

AIMS

This report supports the MLTSS evaluation planning efforts by describing the statewide use of nursing facilities and HCBS among SPD beneficiaries prior to the implementation of the CCI. We also use Medi-Cal claims and assessment files to identify SPD recipients when they initiate LTSS, and contrast the individual characteristics associated with those entering nursing facilities (NF) for extended stays and those entering community-based personal care service. This information is also incorporated into a comparison of how LTSS use varies among California counties. There are five specific aims:

- Provide counts of the SPD population use of LTSS. These counts are inclusive of both new and continuing users during years 2005 through 2008.
- Identify SPD beneficiaries who use home and community-based services versus those who enter nursing facilities for extended care.
- Identify individual risk factors for entering a nursing facility for extended care versus those starting HCBS in 2006 and 2007
- Estimate the average nursing facility length of stay over 12 months for those entering facilities for extended stays in 2006 and 2007.
- Compare the expected versus observed rates of LTSS entry among new entrants of home and community-based services and nursing facilities across California counties in 2006-2007.

STUDY POPULATION

For the first part of this report we selected a study population of Seniors and Persons with Disabilities (SPD) eligible only for Medi-Cal, and identified the number of individuals who used some form of LTSS at anytime between 2005 and 2008.[14] We excluded recipients who were dually eligible for Medicare and Medi-Cal, persons whose Medi-Cal eligibility was solely due to emergency or time limited circumstances (e.g., a pregnancy, or unresolved immigration status), those defined as having development disabilities, [15] and those under age 18. [16]

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[13] Medi-Cal (California's Medicaid program), like all state Medicaid programs, is means-tested with eligibility limited to individuals with income and assets that meet certain thresholds established by the state within federal guidelines. These thresholds specify the maximum amount of countable income and resources a person may have to qualify; income and resources above these amounts generally make an individual ineligible or require a monthly share of cost for Medi-Cal. In California, all participants in the Supplement Security Income (SSI) program are eligible for Medi-Cal. In addition, individuals aged 65 and over and certain persons with disabilities having income above SSI and up to 100% of the federal poverty level may qualify. Individuals with high medical expenses can qualify for Medi-Cal through the medically needy eligibility group when they spend down their income on nursing facilities and/or other medical expenses to a threshold of $600 monthly.

[14] Appendix A Table A-1 shows a consolidated listing of the Medi-Cal Eligibility Aid Codes. The rows highlighted in blue are used by DHCS to define the SPD population. We used these to both identify the SPD population in the statewide data, and in our claims data base.

[15] We were able to refine the exclusion of the developmentally disabled more fully among the LTSS user sample through the use of claims records that showed receipt of developmental disability related services. The exclusion of those with developmentally disabled beneficiaries addresses the under reporting of supportive living

LTSS users were those who received one of five Medi-Cal HCBS services: Medi-Cal Home Health, In Home Supportive Services (IHSS), Community-Based Adult Services (CBAS), Targeted Case Management (TCM), and Medi-Cal's section 1915(c) home and community-based waivers); and those having extended nursing facility stays at any time during calendar years 2005-2008.[17] Medi-Cal eligibility files were used to identify monthly SPD eligibility.[18]

Our analysis of nursing facility (NF) use distinguishes extended stays from skilled placements. Skilled nursing facility (SNF) stays are for recipients who need post-acute skilled or rehabilitative services of relatively short duration, usually following a hospitalization. We considered NF admissions as extended if a length of stay was equal to or greater than 21 consecutive days or the individual died in the facility.[19]

For analysis of LTSS entry we limited the study population to those entering HCBS or a nursing facility in 2006 or 2007. To isolate these new enrollments, we applied several targeted service use exclusions. For example, to define new HCBS entrants, we excluded beneficiaries who had received HCBS services at anytime in the 12-months preceding. Analyses of extended NF stays likewise excluded anyone having an extended NF stay in the 12 months preceding NF entry in 2006 or 2007. Recipients of any HCBS (including IHSS) in the prior period were retained in the analysis of NF entry. The specified time window was used to create a 12-month look-back period and 12-month follow-up period for all SPDs initiating HCBS or NF care during the study period.

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arrangements available to this population that are not funded through Medi-Cal (e.g., developmental centers, supervised apartments, group homes). These resources are alternatives to nursing facility placement. This exclusion was necessary as the users of these services are unknown in our available data.

[16] Analyses of beneficiaries dually eligible for Medicare and Med-Cal are reported in a series of separate papers see Home and Community-Based Services at http://camri.ucsf.edu/files/hcbs-report-dhcs_0.pdf.

[17] Recipients may have used other supportive services that enabled them to live in the community. Examples of such services are audiology; durable medical equipment; private duty nursing; occupational, physical and speech therapy; and renal dialysis. The use of these services in the absence of the above services did not qualify the recipient for inclusion in the study population. IHSS is funded through the Medi-Cal state plan, because of this recipients can concurrently use HCBS waiver programs, as well as programs such as CBAS, home health. Also, unlike waivers, IHSS users are not limited to only those meeting nursing home eligibility criteria.

[18] See Appendix A for a short description of each service and a listing of the vendor and other service codes associated with these programs.

[19] Extended NF stays were identified through an examination of Medi-Cal and Medicare claims as well as the NF Minimum Data Set (MDS) resident assessment files for 2005 through 2008. This composite view established admission and discharge dates, payer sources, and helped designate the purpose of the admission as either rehabilitation or extended stay.

DATA SOURCES & MEASURES

We used information from the *Monthly Medi-Cal Eligible Months* provided by the State of California, Department of Health Care Services Research and Analytic Studies Branch (DHCS RASB) [20] to produce a statewide count of the SPD population for each study year. The monthly counts were summed over the period of interest and then divided by the number of months in the period. The county level tables did not provide enough detail to limit counts to adult SPDs, so state level percentages of SPDs were applied to the county level counts to create county adult SPD estimates. These data were augmented with a count of LTSS service recipients in each county. The counts were identified from an existing 2005-2008 longitudinal database of Medi-Cal LTSS recipients. These data allowed us to create counts on how the SPD population was distributed between HCBS and NF users, and to differentiate prevalent service recipients from those entering these programs during each study year.[21] The longitudinal database contains Medi-Cal and Medicare claims and assessment data of LTSS recipients in California. We used claims and assessments to identify LTSS program entry and participation dates. The database includes all adults who received a Medi-Cal reimbursed LTSS at anytime between 2005 and 2008.

For the new LTSS recipients, we identified beneficiary age, sex, race/ethnicity from Medi-Cal eligibility files. Diagnoses codes were obtained from Medi-Cal claims and hospital records (Office of Statewide Planning and Development Patient Discharge Data, OSHPD PDD). An indicator of homeless status between 2005 and 2008 was obtained from the PDD file. The first HCBS entry in a study year generally defined the type of HCBS entered. However, concurrent use of IHSS and other HCBS programs starting in the same 90-day period was defined as initial IHSS use. We categorized diagnoses using the Chronic Illness and Disability Payment System (CDPS). This tool consolidates all diagnostic codes into 58 categories and assigns each a score that represents the incremental, prospective expenditure risk associated with that category.[22] CDPS categories are hierarchical within these major categories. Higher scores reflect greater morbidity. For the LTSS entry analysis, we were also able to augment beneficiary characteristics to include functional and cognitive ability measures, and living arrangement. This information was available from the assessments contained in the *Case Management Information and Payrolling System* (CMIPS) used for those entering IHSS,[23] the *Minimum Data*

[20] State of California, Department of Health Care Services Research and Analytic Studies Branch Medi-Cal Member Months for the Fiscal Years. Sacramento, California, October 2013. http://www.dhcs.ca.gov/dataandstats/statistics/Pages/RASD_Default.asps.

[21] It was created as part of a partnership between the University of California and the California Department of Health Care Services (DHCS), the California Medicaid Research Institute (CAMRI). The data from multiple sources were integrated using Social Security numbers to link the Medi-Cal sample population with Medicare's enrollment file to identify Medi-Cal recipients who were also enrolled in Medicare during any month of the study period, and to link assessments and Medi-Cal claims records for each recipients. The linked data files were made available to us using a common encrypted identification number. This number replaced the Social Security, Medi-Cal, and Medicare identification numbers. These data security procedures were approved by the University of California Committee on Human Research (#10-02998) and the California Committee for the Protection of Human Subjects (#12-06-0416)

[22] Kronick R, Gilmer T, Dreyfus T, et al. Improving health-based payment for Medicaid beneficiaries: CDPS. *Health Care Financing Review,* 2000: 21(3):29-64

[23] California Department of Social Services (CDSS). *IHSS/Case Management Information and Payrolling System (CMIPS) User's Manual*. Sacramento: CDSS, 2005.

Set (MDS) for those entering nursing facilities;[24] *Outcome, Information and Assessment Set* (OASIS)[25] used for those receiving home health care; and *Inpatient Rehabilitation Facility Patient Assessment Instrument* (IRF/PAI)[26] for those discharged from rehabilitation hospitals. If multiple assessments were present, the assessment most current relative to the date of LTSS program entry was used.

ANALYSIS

The analyses have been organized into three sections. The first looks at the SPD population for each of the study years, showing the distribution between LTSS and non-LTSS recipients, and the distribution between various HCBS programs. The second section describes the SPD population entering LTSS, identifying recipient characteristics associated with program entry. Additionally, we use logistic regression models to estimate the adjusted likelihood of individual characteristic on nursing facility entry. One model uses only cases that initially entered LTSS via IHSS. A second model includes this initial group, as well those who first came into LTSS through another HCBS program. Case-mix adjusted analysis of HCBS recipients is largely limited to IHSS and nursing facility users as recipient data on the other HCBS programs is usually unavailable for those who have not received either an IHSS or a nursing facility entry assessment.

Missing assessment data is a modest limitation in the analysis, as IHSS is by far the most common type of HCBS program (>85% of initial HCBS users) either used alone or in combination with the other HCBS services, including the HCBS waivers. The IHSS program has historically featured limited care coordination, but this is a core function in the adult HCBS waiver programs (i.e., MSSP and the smaller HCBS waivers). The waiver programs are intended to target the frailest HCBS recipients.[27] These programs are usually offered in combination with IHSS.

The third section uses propensity score sums within each California County to obtain a risk-adjusted estimate of entry into nursing facilities and HCBS (limited to individuals with enough data points to generate a propensity score). The expected entries are divided by the observed entries within each county. The resulting ratios are indicators of whether a given county has higher or lower than expected (by statewide experience) entries into of nursing facilities and HCBS, adjusting for the demographic and health characteristics of the LTSS entrants within the county.

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[24] U.S. Centers for Medicare & Medicaid Services (CMS). *Revised Long Term Resident Assessment Instrument User's Manual: Minimum Data Set (MDS) Version 2.0*. Washington, DC: American Health Care Association, 2002.

[25] Center for Health Services Research. *Outcome, Information and Assessment Set, Start of Care (OASIS-B1)* UCHSC, Denver: CO, 2002.

[26] Centers for Medicare & Medicaid Services. IRF/PAI Form CMS Number 10036. US Department of Health & Human Services: Washington, DC, 2006

[27] These waivers include In-Home Medical Care (IHMC), In-Home Operations (IHO), Nursing Facility Acute Hospital (NF/AH), Nursing Facility A/B (NF/AB), and Nursing Facility SubAcute (NF/SA), and the AIDS and the Assisted Living Waiver (ALW). See Appendix A for a brief description of these waivers.

RESULTS

LTSS Use by the Medi-Cal SPD Population

Our first study aim is to determine the number of LTSS program users within the SPD population. Table 1 shows the number of SPDs statewide who were eligible for Medi-Cal in each of the study years, and the number using some form of LTSS in that year. We also show how LTSS users are distributed between those using nursing facilities and HCBS. Just under 3% are using NFs, either as continuing residents or new entrants. This rate is relatively constant across the observation years. HCBS use, on the other hand, increased from 14.4% to over 18.6% of the total SPDs during the period. Over the four years, the percentage of recipients using both NFs and HCBS in the same year ranged from 0.5% to 0.7% of the SPD eligibles. In comparative terms, more than 83.5% of LTSS users received HCBS rather the nursing facility care in 2005. That difference widen to 85.9% by 2008.

Table 1
LTSS Prevalence Among Medi-Cal Only SPDs

				Nursing Facility		HCBS	
Year	SPD Eligibles[a]	Total LTSS Users	% Total LTSS Users[b]	Total NF Users	% Total NF Users	Total HCBS Users	% Total HCBS Users
2005	536,844	89,608	16.7	14,824	2.8	77,473	14.4
2006	541,427	97,695	18.0	15,201	2.8	85,429	15.8
2007	550,320	107,306	19.5	16,205	2.9	94,535	17.2
2008	561,868	117,019	20.8	16,474	2.9	104,256	18.6

[a] These counts were derived from data provided by the State of California, Department of Health Care Services Research and Analytic Studies Branch (DHCS RASB) Medi-Cal Member Months for the Fiscal Years. Sacramento, California. http://www.dhcs.ca.gov/dataandstats/statistics/Pages/RASD_Default.asps.

[b] Percentages compare the number of LTSS users to the number of SPD eligible and are rounded to nearest 10th of a percent. The sum of % Total NF Users and % Total HCBS Users may exceed the % Total LTSS Users because of users who received both services at sometime during the year.

Table 2 shows the use of HCBS programs relative to the SPD population, distinguishing those using only IHSS, those using IHSS concurrently with another HCBS,[28] and the recipients who used only one of several state plan programs or HCBS waivers without IHSS. Most notable in this table is that IHSS, either alone or in combination with other HCBS programs, was both predominantly and increasingly used over the study years. IHSS use grew from 82.0% of all HCBS users (63,599) in 2005 to 88.2% in 2008 (91,913). Use of CBAS alone (i.e., without IHSS or other services) accounted for 7.1% of HCBS recipients in 2005, declining to 4.8% by 2008.[29] The users of Medi-Cal home health and targeted case management (TCM) without IHSS or other HCBS programs declined slightly, but each accounted for well under 1% of the SPD population, and a fraction of the HCBS recipients in 2005 (5.8% and 3.8% respectively). This use declined further by 2008. The remaining HCBS users were distributed between those using MSSP and other waivers (all without concurrent IHSS use). Each of these combinations accounted for 0.1% or less of SPD eligible in each of the study years.

[28] Concurrence means that both services were being received at sometime during the year.
[29] Percentages of total HCBS users are derived from but not shown in table 1.

Table 2
HCBS Prevalence Among Medi-Cal Only SPDs

		In Home Supportive Services and Other Home & Community Based-Care							
Year	SPD Eligibles	Total HCBS Users	IHSS Only	IHSS plus other HCBS	CBAS Only	Home Health Only	TCM Only	HCBS Waivers Only	Other [c]
2005	536,844	77,473 14.4%	54,654 10.2%	8,885 1.7%	5,527 1.0%	4,500 0.8%	2,959 0.6%	575 0.1%	373 <.1%
2006	541,427	85,429 15.8%	62,117 11.5%	9,801 1.8%	5,317 1.0%	4,325 0.8%	2,996 0.6%	539 0.1%	334 <.1%
2007	550,320	94,535 17.2%	71,072 12.9%	10,719 2.0%	5,046 0.9%	3,890 0.7%	2,956 0.5%	559 0.1%	293 <.1%
2008	561,868	104,256 18.6%	80,316 14.3%	11,597 2.1%	5,024 0.9%	3,470 0.6%	3,021 0.5%	515 0.1%	313 <.1%

Percentages are based on the number of SPD eligibles, compared to the number of service recipients in each column, rounded to nearest 10^{th} percentile.

LTSS Program Entrants

As shown in Table 3, there were 40,074 new LTSS entrants between 2006 and 2007, an average annual rate of 19.6% relative to the prevalent LTSS users (n= 204,001) in these two study years, or about 3.7% of the SPD population. (This population rate was 3.6% in 2006). Of these new entrants, 82.3% entered HCBS, with the balance (17.7%) entering NFs over these two years. The percentage entering HCBS increased slightly between 2006 and 2007. The preponderance of HCBS entrants (97.2%) in this period were in fee for service Medi-Cal. This rate was slightly higher (98.5%) for those in NFs. Of those entering HCBS, during these two years, 2.1% had been previously in a NF (n=687). This contrasts with 16.3% of the NF entrants who had been receiving HCBS (n=1,158). The mean length of stay in the post-LTSS entry year was 222 days (standard deviation 160.4 days) for those entering HCBS, and 154 days (standard deviation 138.6 days) for those entering NFs. Length of stay statistics were bounded by 1 and 365 days.

Table 3
LTSS Entry Rates Among SPD Adult Population, 2006-2007

Years	Total LTSS Users[a]	LTSS Entrants		HCBS Entrants		NF Entrants	
	n	n	Pct	n	Pct	n	Pct
2006	97,695	19,999	20.5%	16,156	80.8%	3,844	19.2%
2007	107,306	20,075	18.7%	16,834	83.9%	3,240	16.1%
Total	204,001	40,074	19.6%	32,991	82.3%	7,083	17.7%

[a] The count of LTSS users was obtained from a 2005-2008 longitudinal database of Medi-Cal LTSS recipients created as created as part of a partnership between the University of California and the California Department of Health Care Services (DHCS), and the California Medicaid Research Institute (CAMRI), University of California, San Francisco. The database includes all adults who received a Medi-Cal reimbursed LTSS at any time during those calendar years.

SPD Population Characteristics

As the analysis moves from population estimates to an examination of service users, a wider array of recipient characteristics becomes available. For all LTSS users, we are able derive information on age, race/ethnicity, and death from program eligibility files; and to identify health conditions from claims and *California Office of Statewide Health Planning and Development (OSHPD) Patient Discharge Data (PDD)* for the 12 months prior to LTSS initiation. Health conditions have been generally represented in our analysis by a Chronic Illness and Disability Payment System (CDPS) score. This is a weighted sum that is inclusive of an individual's co-morbidities as demonstrated by diagnoses codes found in Medi-Cal and claims, as well as PDD hospital records. This score was supplemented with four measures thought to be germane to identifying SPD subgroups in particularly fragile living situations. Three of these measures were specific condition indicators from the CDPS process: Central Nervous System (CNS) (i.e., the part of the nervous system that consists of the brain and spinal cord) disorders, psychological and substance abuse problems. The fourth is an indicator of homeless status obtained from the PDD between 2005 and 2008. For persons who entered nursing facilities, IHSS, or who had home health care or rehabilitation hospital discharge assessments, we were usually able to obtain information on functional limitations, cognitive impairment, and living arrangement from program assessment files. A total of 40,074 SPD beneficiaries had entered LTSS in 2006 or 2007. Of these 21.4% (n=8,225) were missing assessment information. This is largely indicative of those who had entered a HCBS program other than IHSS.[30]

Table 4 shows the characteristics for IHSS, non-IHSS, and nursing facility entrants in 2006 and 2007. We defined ADL limitations as having three or more limitations in activities of daily living requiring human assistance (e.g., bathing, dressing, toileting, transferring, eating). Cognitive limitations were defined by the need for at least supervision due to impairment in memory, judgment, or orientation. Finally, we augmented the live alone information from the assessment data, with the OSHPD Patient Discharge Data indicator for homelessness between 2005 and 2008.

The data reveal minor differences in age and race/ethnicity distribution between the subsamples of those receiving IHSS and those in nursing facilities, and between IHSS recipients and those in HCBS not receiving IHSS as their initial HCBS program. Those aged less than 45 are under-represented in NFs, and those aged 55-64 are over-represented. Whites are the most prevalent in each of the three service groups (about 40%) and tended to have this 'expected' representation in all the service groups. Blacks, about 22% of the sample, were somewhat over-represented in IHSS (26.5%), proportionately represented in NFs, and under-represented in non-IHSS programs (11.3%). Hispanics, also about 20% of the sample, were proportionately represented in IHSS and NFs, but had a somewhat higher representation (23.1%) among non-IHSS recipients. Asians were proportionately represented in IHSS and non-IHSS programs, and under-represented in in NFs. The Other race/ethnicity group was proportionately represented in IHSS, but over represented in Non-IHSS programs and NF. Over half of the HCBS recipients

[30] Those without assessments included those having short stay NF placements (n=1,265); those in the CBAS program (n=2,491), Medi-Cal home health recipients (n=1,326), TCM recipients (n=2,780), AIDS waiver recipients (n=143), Assisted Living waiver recipients (n=13), MSSP waiver recipients (n=7). There were also 200 IHSS entrants for whom the assessments were missing.

Table 4
SPD LTSS Service Entrants 2006 & 2007

Variable	IHSS		Non-IHSS		NF	
	n	Col%	n	Col%	n	Col%
Total[a]	20,902	100.0	5,129	100.0	5,818	100.0
Age						
<45 (reference)	4,414	21.1	959	18.7	858	14.7
45-54	6,409	30.7	1,536	29.9	1,702	29.3
55-64	7,256	34.7	1,810	35.3	2,558	44.0
65+	2,823	13.5	824	16.1	700	12.0
Female (reference Male)	11,865	56.8	2,671	52.1	2,455	42.2
Race/Ethnicity[b]						
White (reference)	8,008	38.3	2,252	43.9	2,539	43.6
Hispanic	3,979	19.0	1,183	23.1	1,110	19.1
Black	5,541	26.5	578	11.3	1,198	20.6
Asian	2,278	10.9	549	10.7	442	7.6
Other	1,096	5.2	567	11.1	529	9.1
ADL limitations[c]	7,619	36.5	876	17.1	3,788	65.1
Cognitive limitations[d]	7,402	35.4	1,444	28.2	2,760	47.4
Living Alone	5,334	25.5	751	14.6	1,551	26.7
Homeless[e]	260	1.2	129	2.5	447	7.7
CDPS score [f]	(0.92, 1.22)		(1.94, 1.62)		(1.54, 1.68)	
CNS Condition[g]	1,468	7.0	825	16.1	1,044	17.9
Psychological Condition[g]	1,193	5.7	823	16.0	855	14.7
Substance Abuse[g]	1,657	7.9	951	18.5	1,115	19.2

[a] The total of recipients (n=31,849) is less than the number (n=40,074) shown in Table 3 as LTSS entrants missing information on living alone or any other items were omitted (n=8,225). This was usually due to the absence of an assessment. Such cases included those having short stay NF placements (n=1,265); those in the CBAS program (n=2,491), Medi-Cal home health recipients (n=1,326), TCM recipients (n=2,780), AIDS waiver recipients (n=143), Assisted Living waiver recipients (n=13), Other HCBS users (n=7). There were also 200 IHSS entrants missing assessments.

[b] Asian includes individuals from Asia (e.g., Japan, Korea, China) as well as Pacific Islanders (e.g., Philippines, Guam). Other includes Alaskan Native, American Indian, Unknown, Missing.

[c] ADL items available in CMIPS and the MDS are common in terms of activities of daily living (i.e., bathing, dressing, toileting, transferring, eating). Our ADL limitations measure indicates that the individual requires at least the need of assistance (if not more assistance) from another in three or more ADL tasks. Reference is < 3 ADL limitations

[d] Cognitive status is based on Memory, Orientation, and Judgment items in the CMIPS and MDS instruments. Having one item requiring at least verbal assistance/supervision/cueing identifies an individual as having a cognitive limitation in our common measure. Reference, Supervision not required

[e] Homelessness between 2005 and 2008 is indicated in the OSHPD PDD file as County code='00'.

[f] Chronic Illness and Disability Payment System score. Kronick R, Gilmer T, Dreyfus T, et al. Improving health-based payment for Medicaid beneficiaries: CDPS. *Health Care Financing Review,* 2000: 21(3): 29-64. Values shown are respectively mean and standard deviation.

[g] Diagnosis codes related to conditions of the central nervous system, psychological and substance abuse conditions (see http://cdps.ucsd.edu/license.html)

were women. Males were about 58% of the nursing facilities users. Among the more striking comparisons were those of the ADL and cognitive limitations, where almost twice as many NF residents (65% vs. 36%) as IHSS recipients had three or more ADL limitations, and 47.4% vs. 35.4% had cognitive limitations. There were even larger proportionate differences in the percentages with CNS (17.9% vs. 7%), psychological (14.7% vs. 5.7%), and substance abuse conditions (19.2% vs.7.9%). In contrast, NF and non-IHSS recipients had relatively similar prevalence of these conditions. Mean CDPS scores were about half a point higher for NF residents compared to IHSS recipient, and another half point higher for those in the non-IHSS group than in the NF group. Living arrangements revealed differential risks. IHSS and NF recipients had similar proportions (about 26%) living alone at time of service entry. This compares to about 15% among the non-IHSS group. However, among those known to be homeless, the highest prevalence was among those entering nursing facilities (7.7%). The proportion was 2.5% and 1.2% among those entering non-IHSS programs and IHSS respectively.

Predicting the Likelihood of Nursing Facility & HCBS Entry Among SPD Eligibles

As a preliminary step toward the comparison of LTSS use across counties, we conducted multivariate logistic regression models to estimate the contributions of different characteristics to the likelihood of NF entry, when adjusting for all risk factors in the models. These analyses used our sample of LTSS entrants during 2006 and 2007 who were non-Medicare and SPDs, and for whom sufficient data were available to calculate the probability of NF versus HCBS entry. From our models, we generated propensity scores, i.e. predicted probabilities of nursing facility and HCBS entry for each individual based upon the characteristics shown in Table 4.

Two of our models (IHSS only versus all HCBS entrants) are shown in Appendix C. The results are generally similar. Those aged 55-64 have a marginally higher odds of NF entry compared to those under age 45. Women have about 40% lower odds than men; Hispanic and Black race/ethnic groups each tend to have about a 20% lower odds than Whites. Those categorized as Asians tend to have about a 30% lower odds than Whites. On the other hand, those classified as “Other” tend to have about a 30% higher NF entry odds than Whites. This risk is even higher if only IHSS entry is considered. Characteristics having the highest association with NF entry are 3 or more ADL limitations, and being homeless. Both of these characteristics were associated 300-400+% increase odds of NF entry relative to those not having these characteristics.

Cognitive limitations, CNS conditions, psychological conditions, and substance abuse problems each show an 30% to 50% increased odds of NF placement compared to those without the condition (after adjusting for all other chronic conditions. Those living alone have at least a 20% increased odds of NF entry compared to those living with others.

Comparing Observed versus Predicted NF and HCBS Use Across Counties

This section builds off of the risk prediction models introduced above to present NF-HCBS service use comparisons across California counties. These results adjust for recipient health conditions and other risk factors. The analysis incorporates the number of SPD enrollees, and

the expected and observed counts of SPDs entering HCBS and NFs.[31] We combined two years (2006-2007) because of the relatively small number of individuals in many counties using these services. The second dimension of the analysis is an estimate of the expected number of persons entering NFs (versus HCBS programs) over the 24-months. This is based on the predicted likelihood of use given the characteristics of SPDs residing in each county.[32] We then create a ratio of observed/expected NF entries for each county.

To provide a confidence interval around these ratios we used a resampling procedure known as bootstrapping.[33] For this we first took 500 unrestricted random samples (with replacement) from the file of propensity scores. Next we summed the propensity scores in each sample to create a distribution of 500 expected counts of NF entries. A ratio of observed/expected entries was then created for the expected number in the distribution. A 99% confidence interval shows the statistically significant range or scores around the ratio calculated for each county. Counts of SPDs between 2006 and 2007, NF entries and expected entries during this period, as well as the observed versus expected ratios are shown in Table 5. The counties are sorted from those with the highest ratio to the lowest. Ratios with confidence limits that are both above 1.0 indicate that the number of NF entries versus HCBS entries is higher than expected given the health and demographics of the population. Counties whose confidence limits include 1.0 are realizing NF entry rates that are similar to the state as a whole. Confidence intervals that are both below 1.0 are placing individuals into NF rather than HCBS at a lower than expected rate.

Tables 5 & 6 show that the number of SPDs has a wide range across the counties, and a similarly wide range in the approximate number of NF and HCBS entrants in the study period. As seen in Table 5, there were six counties with statistically significant NF use ratios greater than 1.0 meaning that the observed number was greater than the expected number of NF entrants. Riverside County's observed/expected ratio (1.33) was the highest with a one-third higher rate of NF entry versus HCBS than expected. San Diego's NF entry is 19% higher and Santa Clara is 16% higher than expected. The county (Los Angeles) with the highest number of SPD's shows a 3% higher rate of NF entry than expected. Twenty counties use NF at a statistically significant lower rate than expected. Seven of these counties have entry rates at less than half the expected (< 0.50). Estimates were either non-significant in eight counties (Marin, Del Norte, Venture, Tulare, Humboldt, Fresno, El Dorado, Nevada, Contra Costa) or could not be calculated in 16 counties. The non-calculation was due to the absence of claims data because the county was participating in a managed care demonstration and reliable claims data were unavailable (Monterey, Orange, San Mateo, Santa Cruz, Santa Barbara, & Solano) or when the expected counts of NF entries were so low that the calculated ratios were unstable (Alpine, Amador, Colusa, Glenn, Inyo, Lassen, Madera, Mariposa, Modoc, Mono, Napa, Plumas, San Benito, Sierra, Trinity, Yolo).

[31] The HCBS and NF entrants (n=31,849) are the recipients described in Table 4. This is an undercount of LTSS recipients as it excluded recipients missing assessment data needed for the service prediction model.

[32] As shown in Appendix C, we used age, race/ethnicity, sex, health conditions, ADL and cognitive limitations, mental health, and living arrangements characteristics in combination to create a propensity score reflecting the likelihood of NF entry vs. entering a HCBS program.

[33] Efron, B., Tibshirani, R. *An Introduction to the Bootstrap*. Chapman and Hall: Boca Raton, 1998.

Table 5
Comparison of Observed vs. Expected NF Entrants by County 2006-2007

County[a]	SPD[b] Counts	Observed NF Entrants[c]	Expected NF Entrants[d]	Observed/ Expected NF Ratio	99% Confidence Interval of Ratio	
					Lower	Upper
Riverside	25,966	319	240	1.33	1.26	1.41
San Diego	31,623	577	484	1.19	1.14	1.25
Marin	1,236	27	23	1.18	0.95	1.42
Santa Clara	17,791	173	149	1.16	1.07	1.26
San Francisco	9,485	386	335	1.15	1.10	1.21
San Bernardino	35,785	406	371	1.10	1.05	1.15
Alameda	21,760	291	276	1.05	1.00	1.10
Los Angeles	172,094	2,340	2,272	1.03	1.01	1.05
Del Norte	935	14	14	1.03	0.84	1.31
Ventura	7,305	59	61	0.97	0.87	1.10
Tulare	12,624	60	62	0.96	0.87	1.07
Humboldt	2,509	36	38	0.96	0.85	1.09
Fresno	25,740	129	138	0.93	0.87	1.00
Kern	18,812	95	106	0.90	0.82	0.98
Sonoma	3,780	63	71	0.88	0.81	0.97
San Joaquin	15,097	107	122	0.88	0.82	0.94
Yuba	2,001	19	22	0.87	0.74	1.01
El Dorado	1,282	17	20	0.87	0.72	1.03
Nevada	717	10	12	0.83	0.65	1.06
Contra Costa	10,697	99	120	0.83	0.76	0.89
Sacramento	31,526	221	272	0.81	0.77	0.86
Placer	2,082	25	32	0.79	0.67	0.94
Siskiyou	1,018	9	12	0.76	0.63	0.92
Kings	2,790	19	26	0.74	0.65	0.87
Sutter	1,603	11	15	0.74	0.63	0.89
Imperial	4,278	33	48	0.69	0.61	0.79
Stanislaus	10,404	59	87	0.68	0.62	0.73
Merced	7,230	27	42	0.64	0.57	0.71
Tuolumne	718	7	13	0.54	0.42	0.69
Lake	1,442	15	31	0.49	0.43	0.59
Mendocino	1,813	14	29	0.48	0.41	0.55
Calaveras	490	5	11	0.47	0.36	0.61
San Luis Obispo	2,300	12	25	0.47	0.42	0.54
Butte	4,712	37	79	0.47	0.43	0.51
Shasta	3,706	21	59	0.36	0.33	0.39
Tehama	1,363	5	18	0.29	0.24	0.33

a. Counties with County Organized Health Systems (COHS) are excluded from this table. These include: Monterey, Orange, San Mateo, Santa Cruz, Santa Barbara, & Solano. A COHS is a county agency contract with the Medi-Cal program to provide healthcare services to Medi-Cal eligible persons under a capitated funding arrangement. Thus instances of NF and HCBS use are not available from Medi-Cal claims.

b. The counts of SPDs for the county level denominators were estimated from tables of *Monthly Medi-Cal Eligible Months*. Member months were summed over 2006 and 2007 and then divided by 24 months to produce an average monthly estimate. The county level tables do not identify adult SPDs, so state level percentages were applied to the county level counts to create county adult SPD estimates.

c. Four counties, Alpine, Madera, Napa, and Yolo did not have LTSS service entrants in the LTSS users database for 2006-2007

d. Counties with fewer than 10 expected NF entries were deemed to have unstable ratios and thus are excluded. These include: Amador, Colusa, Glenn, Inyo, Lassen, Mariposa, Modoc, Mono, Plumas, San Benito, Sierra, & Trinity.

Table 6 show comparisons between the observed number of HCBS entrants and the number expected using our propensity-adjusted calculation. These data are generally arrayed in the same county listing order as the NF, however, this listing includes 10 more counties with a sufficient number of expected HCBS users to qualify for inclusion in this table. The counties are sorted lowest to highest in terms of their ratio values. These results are largely an inverse of the NF results. There were 20 counties with statistically significant HCBS use ratios greater than 1.0 meaning that the observed number was greater than the expected number of HCBS entrants. This included a mix of 16 smaller population and 4 medium population size counties (Sacramento, San Joaquin, Contra Costa, and Stanislaus). The entry rate range across these 20 counties was between 2% and 13% higher than expected. Seven of these counties had observed/expected ratios greater than 1.10, reflecting a HCBS entry rate more than 10% higher than expected. There was a different pattern among several larger counties (Riverside, San Bernardino, San Diego, Santa Clara, San Francisco) where there were 2% to 7% fewer observed HCBS users than was expected after adjusting for SPD population characteristic. However, Los Angeles, with the highest number of SPD's along with 19 other counties had rates of HCBS use that were so close to parity between observed and expected use that there were no statistically significant differences. Estimates could not be calculated in 12 counties due to the absence of claims data among counties participating in a managed care demonstration or when the counts of HCBS entries were so low that the calculated ratios were too unstable to be useful.

Table 6
Comparison of Observed vs. Expected HCBS Entrants by County 2006-2007

County[a]	SPD[b] Counts	Observed HCBS Entrants[c]	Expected HCBS Entrants[d]	Observed/ Expected HCBS Ratio	99% Confidence Interval of Ratio	
					Lower	Upper
Amador	301	10	12	0.80	0.71	0.90
Riverside	25,966	987	1,066	0.93	0.91	0.94
San Diego	31,623	1,904	1,997	0.95	0.94	0.96
Marin	1,236	90	94	0.96	0.92	1.01
Santa Clara	17,791	607	631	0.96	0.94	0.98
San Francisco	9,485	1,263	1,314	0.96	0.95	0.97
San Bernardino	35,785	1,441	1,476	0.98	0.97	0.99
Alameda	21,760	1,042	1,057	0.99	0.97	1.00
Los Angeles	172,094	10,790	10,858	0.99	0.99	1.00
Del Norte	935	54	54	0.99	0.99	1.05
San Benito	698	31	31	0.99	0.93	1.09
Plumas	248	28	28	0.99	0.93	1.06
Ventura	7,305	266	264	1.01	0.98	1.03
Tulare	12,624	246	244	1.01	0.98	1.03
Humboldt	2,509	153	151	1.01	0.98	1.05
Trinity	274	34	34	1.01	0.96	1.09
Fresno	25,740	611	602	1.02	1.00	1.03
Kern	18,812	445	434	1.02	1.00	1.05
Sonoma	3,780	342	334	1.02	1.00	1.04
Yuba	2,001	119	116	1.02	1.00	1.05
Lassen	569	38	37	1.02	0.96	1.09
Glenn	593	43	42	1.03	0.99	1.08
San Joaquin	15,097	575	560	1.03	1.01	1.04

Table 6 Continued

El Dorado	1,282	90	87	1.03	0.99	1.09
Nevada	717	53	51	1.04	0.98	1.11
Kings	2,790	156	149	1.04	1.02	1.07
Sacramento	31,526	1,299	1,248	1.04	1.03	1.05
Contra Costa	10,697	483	462	1.05	1.02	1.07
Placer	2,082	135	128	1.05	1.02	1.09
Siskiyou	1,018	61	58	1.05	1.00	1.10
Sutter	1,603	85	81	1.05	1.02	1.08
Imperial	4,278	250	235	1.06	1.04	1.09
Merced	7,230	276	261	1.06	1.04	1.08
Mariposa	229	20	19	1.07	1.02	1.14
Stanislaus	10,404	438	410	1.07	1.05	1.09
Madera	2,904	123	113	1.09	1.05	1.12
San Luis Obispo	2,300	166	153	1.09	1.06	1.11
Tuolumne	718	67	61	1.10	1.05	1.16
Mendocino	1,813	157	142	1.11	1.08	1.14
Inyo	204	17	15	1.12	0.99	1.31
Shasta	3,706	352	314	1.12	1.10	1.14
Lake	1,442	135	119	1.13	1.09	1.18
Calaveras	490	50	44	1.13	1.07	1.20
Tehama	1,363	109	96	1.13	1.10	1.17
Butte	4,712	337	295	1.14	1.12	1.17
Colusa	313	17	14	1.19	1.14	1.26

a. COHS Counties are excluded because NF admission cannot be determined though Medi-Claims. These include: Monterey
Orange, San Mateo, Santa Cruz, Santa Barbara, & Solano

b. The counts of SPDs for the county level denominators were estimated from tables of *Monthly Medi-Cal Eligible Months*, Member months were summed over 2006 and 2007 and then divided by 24 months to produce an average monthly estimate. The county level tables do not identify adult SPDs, so state level percentages were applied to the county level counts to create county adult SPD estimates.

c. Three counties, Alpine, Napa, and Yolo did not have NF service entrants in the LTSS users database for 2006-2007

d. Counties with fewer than 10 expected NF entries were deemed to have unstable ratios and thus are excluded. These include: Modoc, Mono, and Sierra.

SUMMARY AND CONCLUSIONS

This report supports the MLTSS evaluation planning efforts by describing the statewide use of nursing facilities and HCBS among SPD beneficiaries. We used Medi-Cal claims and assessment files to identify SPD recipients when they initiated LTSS and contrasted the individual characteristics associated with those entering nursing facilities (NF) for extended stays and those entering Medi-Cal funded home and community-based services (HCBS). This information is also incorporated into a comparison of how LTSS use varies across California counties. Among SPD eligibles who received LTSS, we characterize those factors associated with entry into nursing facilities versus receipt of home and community-based services. We produced predicted estimates of NF and HCBS use based upon the SPD population characteristics and compare these estimates to observed use in the study period. Our analysis identifies a baseline of SPD LTSS program use in 2006-2007. This can be a frame of reference against which future trends in use might be compared subsequent to the implementation of the MLTSS demonstration. This work also identified challenges in existing data systems that need

to be addressed. Assessment data is largely unavailable for HCBS recipients that do not enter IHSS or NFs. The OASIS assessments for Medi-Cal home health recipients were generally missing, as were MDS assessments for those entering nursing facilities, who had short stays. Our statewide counts of NF and HCBS use are undercounted because we could not determine use of these services in counties with County Organized Health Systems (COHS).[34] These counties have contracts with Medi-Cal to provide these services under a capitated payment arrangement. Further, the rate of LTSS program entrants is small in many counties leading to unreliable estimates of expected use. The pooling of recipients over extended periods greater than two years may be sufficient to resolve this limitation.

SPD Population and LTSS Use Estimates during 2005-2008

- In 2005, there were approximately 536,840 Seniors and Persons with Disabilities (SPDs) (aged 19 and over) eligible for Medi-Cal. This number grew to about 561,870 by 2008. LTSS use (i.e., inclusive of both HCBS program and nursing facility use) grew from 16.7% of the SPD adult population in 2005 (approximately 89,600 persons) to 20.8% in 2008 (approximately 117,000 persons).
- Just under 3% of the SPD eligibles were using NFs, either as continuing residents or new entrants, annually. This rate was relatively constant across the 2005-2008 observation years.
- HCBS use, on the other hand, increased from 14.4% to over 18.6% of the total SPDs during the same period. Over the four years, the percentage of recipients using both NFs and HCBS in the same year ranged from 0.5% to 0.7% of the SPD eligibles.
- In total, more than 83.5% of SPD LTSS users received HCBS rather the nursing facility care in 2005. That difference widen to 85.9% by 2008.

LTSS Program Entrants

- There were approximately 40,074 new LTSS entrants between 2006 and 2007, an average annual rate of 19.6% relative to all LTSS users (n= 204,001) in these two years. New LTSS users were about 3.7% of the SPD population.
- Of the new entrants, 82.3% entered HCBS, with the balance (17.7%) entering NFs over these two years. The percentage entering HCBS increased slightly between 2006 and 2007. The preponderance of HCBS entrants (97.2%) in this period were in fee-for-service Medi-Cal. This rate was slightly higher (98.5%) for those in NFs.
- Of those entering HCBS, during these two years, 2.1% had been previously in a NF (n=687). This contrasts with 16.3% of the NF entrants who had been receiving HCBS (n=1,158).
- The mean length of stay in the post-LTSS entry year was 222 days (standard deviation 160.4 days) for those entering HCBS, and 154 days (standard deviation 138.6 days) for those entering NFs. [35]

[34] COHS counties during 2005-2008 include: Monterey, Orange, San Mateo, Santa Cruz, Santa Barbara, & Solano.
[35] Length of stay statistics were bounded by 1 and 365 days.

LTSS Program Entrant Characteristics in 2006-2007

- Statewide, SPD LTSS program entrants aged <45 are proportionately under-represented in NFs, and those aged 55-64 are over-represented.
- Whites are the most prevalent SPD racial group (about 40%) and tended to have this proportionate representation across LTSS groups. Blacks, about 22% of the SPD population, were over-represented in IHSS (26.5%), proportionately represented in NFs, and under-represented in non-IHSS programs (11.3%). Hispanics, about 20% of the SPD entrant population, were proportionately represented in IHSS and NFs, and slightly over-represented (23.1%) among non-IHSS recipients. Asians were proportionately represented in IHSS and non-IHSS programs, and under-represented in NFs. The Other race/ethnicity group was proportionately represented in IHSS, but over-represented in Non-IHSS programs and NFs.
- Over half of the HCBS recipients, both IHSS and non-IHSS, were women. Males comprised about 58% of NF users.
- Almost twice as many NF entrants as IHSS entrants (65% vs. 36%) had three or more ADL limitations, and 47.4% (vs. 35.4%) had cognitive limitations. There were even larger proportionate differences in the percentages with CNS (17.9% vs. 7%), psychological (14.7% vs. 5.7%), and substance abuse conditions (19.2% vs.7.9%). NF and non-IHSS recipients had relatively similar prevalence of these conditions. Mean CDPS scores were about half a point higher for NF residents compared to IHSS recipient, and another half point higher for those in the non-IHSS group than in the NF group; ; those with the highest disease burden tended to enter nursing facilities while those with the lowest disease burden tended to enter non-IHSS HCBS programs.
- IHSS and NF recipients had similar proportions (about 26%) living alone at time of service entry. This compares to about 15% among the non-IHSS group.
- Among those known to be homeless, the highest prevalence was among those entering nursing facilities (7.7%). The proportion was 2.5% and 1.2% among those entering non-IHSS programs and IHSS respectivel.

Predicting the Likelihood of NF and HCBS Entry

- We conducted multivariate logistic regression models to estimate the contributions of different characteristics to the likelihood of NF entry versus receiving HCBS. These values where used to create a propensity score predicting the likelihood of NF versus HCBS entry.
- For 2006-2007, six counties had higher than expected rates of NF versus HCBS entry. Twenty-two counties show NF versus HCBS at a lower rate than expected, with seven of these counties entry rates were less than half the expected (< 0.50). Data limitations in 22 counties prevented their inclusion in the NF use analysis.
- Twenty counties had statistically significant HCBS use greater than the expected number of HCBS entrants. The range across these counties was 2% to 13%. Six counties had a contrary pattern, with 4% to 7% having fewer observed HCBS users than expected. Los Angeles, along with 19 other counties had rates of HCBS use close to parity between observed and expected use. Estimates could not be calculated in 12 counties due to data limitations.

APPENDICIES

Appendix A
SPD Eligibility[a] & Other Medi-Cal AID Codes

Table A-1

SPD Medi-Cal Eligibility Aid Category	
Category	**Aid Code**
Families eligible for but not receiving CalWORKs in "1931(b) only" (1931(b))	3N
MI[b] – Adoption or Foster Care	03, 04, 06, 07, 45, 46, 4A, 4K, 4M, 5K
MI[b] – Adult	81, 86, 87
MI[b] – Child	82, 83, 5E, 7T, 8U, 8V, 8W
MI[b] – LTC	53
MN[c] – Aged	14, 17, 1D, 1H, 1X, 1Y
MN[c] – Blind and Disabled	24, 27, 64, 67, 2D, 2H, 6D, 6H, 6S, 6V, 6W, 6X, 6Y, 8G
MN[c] – Families	34, 37, 39, 54, 59, 3D, 5X, 6R, 7J
MN[c] – LTC	13, 23, 63
PA[d] – Adoption or Foster Care	40, 42, 43, 49, 77, 78, 4F, 4G, 4H, 4L, 4N, 4S, 4T, 4W
PA[d] – Aged	10, 16, 18, 1E
PA[d] – Blind and Disabled	20, 26, 28, 36, 60, 66, 68, 2E, 6A, 6C, 6E, 6N, 6P
PA[d] – Families	30, 32, 33, 35, 38, 3A, 3C, 3E, 3G, 3H, 3L, 3M, 3P, 3R, 3U, 3W
TLICP[e] No Premium	5C, H1, H2, H4, 8X
TLICP[e] With Premium	5D, H3, H5
Undocumented[f]	48, 55, 58, 69, 70, 74, 75, 1U, 3T, 3V, 5F, 5G, 5H, 5J, 5M, 5N, 5R, 5T, 5W, 5Y, 6U, 7C, 7K, 8N, 8T, C1, C2, C3, C4, C5, C6, C7, C8, C9, D1, D2, D3, D4, D5, D6, D7, D8, D9
Other[g]	01, 02, 08, 44, 47, 51, 52, 56, 57, 71, 72, 73, 76, 79, 0A, 0L, 0M, 0N, 0P, 0R, 0T, 0U, 0V, 0W, 0X, 0Y, 2A, 2V, 4V, 5V, 6G, 6J, 7A, 7F, 7G, 7H, 7M, 7N, 7P, 7R, 7V, 8E, 8P, 8R, F1, F2, F3, F4, G0, G1, G2, G3, G4, G5, G6, G7, G8, R1

[a] The SPD criteria are highlighted in Blue. These exclud persons whose Medi-Cal eligibility was solely due to emergency or time limited circumstances (e.g., a pregnancy, or unresolved immigration status). The age 18 cut point used for adults also generally excludes those defined as having development disabilities.

[b] Medically Indigent (MI) are persons who are not covered by Medi-Cal and cannot afford medical care. These individuals are eligible to receive care through county operated programs.

[c] Medically Needy (MN) are persons who meet the requirements for Medi-Cal eligible eligibility but their income is too high. These individuals become eligible when their medical expenses reduce their incomes below a certain level.

[d] Public Assistance (PA) This group includes persons whose Medi-Cal eligibility is determined by their eligibility for public assistance. Also those eligible under the Lynch v. Rank (Pickle) court order, those who are receiving In-Home Supportive Services (IHSS) but not a cash grant.

[e] Targeted Low Income Children's Program (TLICP) provides Medi-Cal eligibility for children of low income families.

[f] Undocumented Aid codes are assigned to individuals who have not provided evidence of satisfactory immigration status but who may be eligible for limited scope of services such as emergency or pregnancy care.

[g] Other aid codes include individuals with refugee status and special eligibility programs.

Appendix B
Medi-Cal's State Plan and Section 1915(c) HCBS Waivers

Medi-Cal's State Plan HCBS. The state plan programs of interest are Adult Day Health Care (operating in 2006-2007) (and since replaced by a waiver program in 2011 known as Community-Based Adult Services or CBAS), Home Health, In-Home Supportive Services, Targeted Case Management. These are keystones to the state's home-and community-based long-term services and supports programs. The HCBS waiver programs generally supplement or coordinate with the state plan programs. State plan services are available on a statewide basis, to all persons qualifying for Medi-Cal meeting the levels of need appropriate to the services.[36]

- **Community-Based Adult Services (CBAS) formerly known as Adult Day Health Care (ADHC)** was implemented to serve beneficiaries at risk of being institutionalized, although during the study period it was not limited to those meeting NF eligibility. ADHC has both medical and social components serving a mix of short-term, post-acute, and longer-term clients. Among the core services are assessment and monitoring of general health and psychosocial status and medications, coordination, communication with other providers, supervision or assistance with ADL/IADLs.
- **Home Health (HH)** California is required by federal law to cover home health. All other HCBS state plan services are optional. Medi-Cal generally covers HH services for homebound persons age 21 and older who are entitled to, but not necessarily eligible for, nursing facility coverage in California. HH must be medically necessary and ordered by a physician as part of a written plan of care that a physician reviews every 60 days. Covered services include skilled nursing; physical, speech and occupational therapy; HH aide; medical supplies, equipment, and appliances for use in the home.
- **In-Home Supportive Services (IHSS)** is the name used by California to label its Personal Care Service program. The IHSS program is limited to individuals who are community-dwelling, eligible for Medi-Cal, and are unable to perform needed activities of daily living (e.g., bathing, dressing, toileting, transferring, eating), and instrumental activities of daily living (e.g., shopping, housekeeping, meal preparation, transportation).
- **Targeted Case Management (TCM)** provides specialized case management services. These include: service plan development, linkage and consultation, assistance to the beneficiary with accessing services, crisis assistance planning, and periodic reviews of the objectives identified in the service plan. TCM does not offer reimbursement for direct care services. Eligibility is more directly tied to language and comprehension barriers than other HCBS programs included in our analysis. Additional criteria include: recipients must be 18 years of age or older on probation and have a medical/mental condition, and have exhibited an inability to handle personal, medical, or other affairs; and/or to be under conservatorship of person and/or estate; a member of a public health, outpatient clinic, linkages, public guardian/adult probate, or community program target population.

[36] For a more extensive description of these programs see our report, *California's Medi-Cal Home & Community-Base Services, Waivers, Benefits & Eligibility Policies, 2005-2008* (Newcomer R, Harrington C, Stone J, Bindman A, Helmar M. (2011) http://camri.universityofcalifornia.edu/documents/medi-cal-waiver-report.pdf

Medi-Cal HCBS Waivers. Medi-Cal waivers allow the state to provide benefits outside of some of the preceding state program and eligibility rules.[37] The most common waiver authority used by states to provide HCBS to Medicaid beneficiaries is §1915(c) of the Social Security Act. Individuals served live in community-based settings but require the level-of-care offered in an institution. Waiver services complement and/or supplement the services that are available to participants through the Medicaid State plan and other federal, state, and local public programs as well as the supports that families and communities provide. Table A-1 summarizes California's HCBS waivers operational during 2006 and 2007. Three of these were initiated during this period. Two of these consolidated previously operating waivers, the third had operated as a pilot project.[38]

Table A-2
Selected Medi-Cal HCBS §1915(c) Waivers Programs[39]
Operational in 2006-2007

AIDS Waiver
The California Department of Public Health's Office of AIDS administers the AIDS waiver. Individuals must meet the nursing home qualifications, income eligibility qualifications, have an active diagnosis of AIDS and live in a setting where in-home services can be provided. The waiver provides case management, homemaker, environmental modifications, skilled nursing, transportation, specialized medical equipment and supplies, attendant care, psychosocial counseling, nutritional supplements, home-delivered meals and nutritional counseling. The AIDS waiver began in California in 1994. In 2005, there were 2,882 waiver participants and total expenditures of $11.9 million; in 2008 these numbers were 2,209 and $8.6 million respectively.
Assisted Living Waiver (ALW)
The Department of Health Care Services administers ALW. This waiver, initiated in 2006, allows case management, skilled nursing services, and an enhanced level of personal care and homemaker services in licensed Residential Care Facilities for the Elderly (RCFEs). These serve older adults and adults with physical disabilities. State regulations, absent this waiver, do not permit state funded IHSS services or HCBS waivers to be used by RCFE residents. The waiver also allows the offering of assisted care services for eligible residents in publicly subsidized housing (PSH). Eligibility requires meeting clinical qualifications for admission to a nursing home, income eligibility, and being at least 21 years of age. Applicants residing in an institutional setting may be eligible for nursing facility transitional care coordination. If they are relocating to a PSH setting, they may be eligible for funds for environmental accessibility adaptations. The waiver covers skilled nursing, personal care and homemaker services as supplements to the RCFE's usual care or IHSS if in PSH--paid through an Assisted Living Services daily rate. Other services are reimbursed to set maximums: care coordination; nursing facility transition services (mostly care coordination available only to those relocating from a nursing facility); environmental accessibility adaptations (limited to those in PSH). ALW served 186 individuals in 2006, at a cost of $1.3 million; and 875 participants at $14.5 million in 2008.

[37] Special features available through a waiver include Geographic Limitations, and Subgroup/Condition Targeting. The former allows programs to target areas of the state where the need is greatest, or perhaps where certain types of providers are available, rather than being statewide. The latter allows limiting waiver services to persons meeting narrow needs criteria, e.g., at risk of institutionalization. Services under a waiver do not have to be available to the Medicaid population at large.

[38] California operated 18 other waivers during some portion of the period of 2005-2008. These were targeted to such things as pregnancy protection, children's dental services, county organized health systems, mental health, and inpatient hospital stay reviews. They do not include home and community-based care for the aged or non-aged adults.

[39] Reference is to §1915(c) of the Social Security Act. Information was obtained from the CMS approved waiver applications and CMS Form 372 reports for the calendar years shown. The In-Home Supportive Service Plus (IHSS Plus) §1115 demonstration waiver was in place between 2004 and 2008. IHSS Plus operated identically to IHSS, except that it allowed payment to legally responsible relatives as IHSS providers. It transitioned into a 1915(j) State Plan Option benefit in 2009. IHSS Plus recipients have been included among those in IHSS for our analytic purposes.

Table A-2 continued

In-Home Medical Care (IHMC) Waiver
The Department of Health Care Services administered the IHMC waiver, operational since 1986. This waiver provided HCBS to severely disabled individuals with a catastrophic illness, and included persons who might be technology dependent, had a risk for life-threatening incidents, and who would otherwise require care in an acute care hospital for a minimum of 90 days. Services included home health aide, respite care, environmental assessment and adaptation, personal emergency response system, private duty nurse, family training, waiver service coordination, and transitional care coordination. The IHMC program was statewide, but enrollment declined to 69 persons by calendar year 2005 and 63 in 2006, its last year of operation. Expenditures in those two years were $11.7 million and $10.6 million respectively. IHMC was consolidated effective January 1, 2007 into the Nursing Facility Acute Hospital (NF/AH) and the In Home Operations (IHO) waivers.
In-Home Operations (IHO) Waiver
The Department of Health Care Services administers the IHO waiver. It was established effective January 2007. This waiver grandfathered a small population of the Medi-Cal beneficiaries who were previously enrolled in the Nursing Facility A/B Level of Care waiver, the Nursing Facility Sub Acute waiver or the In-Home Medical Care (IHMC) waiver. Recipients in the IHO waiver (and the former waiver programs) receive direct care services primarily provided by a licensed nurse and case manager. Additionally, the IHO waiver offers the same services as the NF A/B and NF SA waivers, and adds habilitation and community transition services. IHO waiver services include environmental accessibility adaptations, case management, respite care (home and facility), personal emergency response systems (PERS), PERS installation and testing, community transition services, home health aide services, habilitation services, family training, waiver personal care services, transitional case management, medical equipment operating expenses and private-duty nursing, including shared services. The planned enrollment in 2007 was 210 individuals, but due to the timing of the conversion process, actual enrollment was 188 with $16.2 million in total expenditures. Enrollment in 2008 was 180 with expenditures of $16.1 million.
Multipurpose Senior Services Program (MSSP) Waiver
The California Department of Aging administers the MSSP waiver through 41 regional contractors. This waiver began in 1983. To be eligible, individuals must be 65 or older, reside in a county with a MSSP provider, meet Medi-Cal income qualifications, and be certifiable for Nursing Facility (NF) level of care. Program services includes adult day care, case management, housing assistance, chore/personal care, protective supervision, respite, transportation, meal service, and protective services. About three fourths of MSSP expenditures are for case management. Most MSSP participants are usually jointly participating in IHSS (a state plan program). MSSP declined from 13,871 recipients in calendar year 2005 to 13,143 in calendar year 2008, while program expenditures increased from $43.1 million to $46.99 million.
Nursing Facility Acute Hospital (NF/AH) Waiver
The Department of Health Care Services administers the NF/AH waiver. This waiver was implemented in January 2007. NF/AH (along with the IHO) consolidates three previous waivers: Nursing Facility Level A/B, Nursing Facility Sub Acute and the In-Home Medical Care waivers. NF/AH offers services for individuals at home who would otherwise receive care for at least 90 days in a skilled nursing, intermediate care, sub-acute facility, or an acute care hospital. Services include case management, community transition services, environmental accessibility modifications, facility respite, family training, habilitation, home respite, medical equipment operating expenses, personal care services, personal emergency response systems, private duty nursing, transitional case management. The NF/AH waiver allocates 250 slots for transitioning individuals from a nursing facility. Enrollment was 1,095 in 2007 and 1,464 in 2008. Expenditures were $48.6 million and $63.9 million respectively.
Nursing Facility A/B (NF/AB) Waiver
The Department of Health Care Services administered the Nursing Facility A/B (NF/AB) waiver. This statewide program served physically disabled Medi-Cal beneficiaries who, in the absence of this waiver and as a matter of medical necessity, required care in an inpatient nursing facility for at least 365 consecutive days, and who needed assistance with personal care and/or needed skilled nursing care. Case management was a central component of this program, but it included coverage for several other services: community transition services, personal care services, home health aide services, respite care (both in home and in licensed facilities), environmental accessibility adaptations, personal emergency response systems, private duty nursing, family training, utility coverage, and waiver service coordination. Historically, this waiver had a small enrollment. Between 2001 and 2005 it ranged in size from 538 to 663, decreasing to 645 participants in 2006. Expenditures in 2005 were $16.2 million decreasing to $14.2 million in 2006. There was a waiting list of 649 individuals at the waiver's expiration in 2006. The NF/AH waiver replaced it in 2007. Continuing recipients were transitioned into the NF/AH waiver.

Nursing Facility Sub Acute (NF/SA) Waiver
The Department of Health Care Services administered the NF/SA waiver through 2006. This statewide program provided services to seriously ill, high-cost recipients who would otherwise have received adult or pediatric nursing facility services at a sub-acute level of care for 180 days or more. It also supported the relocation of persons from nursing facilities to the community or diverted persons from entering a nursing facility. Services covered include case management, home health aide services, certified home health aide services, waiver personal care services, respite care, environmental accessibility adaptations, personal emergency response systems, private duty nursing (including shared nursing services), family training, transitional case management services, utility coverage, and waiver service coordination. Services available through the NF/SA waiver generally paralleled those available in the NF/AH waiver. NF/SA had an enrollment of 503 in calendar year 2005 and 505 in 2006. Like the In-Home Medical Care (IHMC) waiver, NF/SA was combined into the NF/AH and IHO waivers in 2007. About half (240) of the NF/SA participants transferred to the NF/AH Waiver.

Table A-3
Medi-Cal Services and Related Vendor Codes

Service Groupings	Vendor Codes (VC) or Other Codes
A) Acute and Other Medical Spending	
Hospital	Claim Type = 2 & VC =/ 62, 80
Physician Services	VC 07, 08, 14, 20, 22, 52, 62, 72, 75, or VC 77 w/ (procedure code =/ 00006~00009), or VC 50, 60 w/ (Claim Type = 1 or 4)
Emergency Department (ED)	Place of Service = 0 or CPT-4 codes (99281~99285)
Hospice	VC 06
PT/OT/ST	VC 34, 35, 36
Other Professional Services	All other Vendor codes not shown below
(B) Post-Acute Care Spending	
Inpatient Rehabilitation Facility (IRF) Spending	VC 59, 69, 79
(C) LTSS Spending	
Nursing Facility (NF)	VC 80
In-Home Supportive Services (IHSS)	VC 89
Adult Day Health Care (ADHC)	VC 01 or (VC 77 w/ procedure code = 00006~00009)
Targeted Case Management (TCM)	VC 92
Home Health (HH)	VC 44
AIDS Waiver (AIDS)	VC 73
Assisted Living Waiver (ALW)	VC 84
Multi-Senior Service Program (MSSP)	VC 81
Other HCBS Waivers: In-Home Operations (IHO)/ Nursing Facility/Acute Hospital (NF AH)	VC 71 w/(procedure code =/ Z5804~Z5807, Z5832~Z5836, Z5838, Z5840)

Appendix C

Predicting the Likelihood of Nursing Facility Entry Among SPD Eligibles

We conducted two multivariate logistic regression models to estimate the likelihood of nursing facility (NF) entry among a statewide sample of SPD beneficiaries who were LTSS entrants in 2006-2007. Both of these models are shown in Table A-4. Model 1 includes all new HCBS and NF program entrants (for whom we had assessment data) in those years. Model 2 repeats the same model, but limits HCBS cases to those who had first entered HCBS as an IHSS recipient. Odds ratios greater than 1.0 are indicative of an increased risk for NF entry compared to entering HCBS (in Model 1) or IHSS (Model 2). Ratios less than 1.0 indicate a lower risk of NF entry.

While both models had similar Goodness of Fit indicators (a generalized R^2), there is not a consistent pattern of one model having higher (or lower) Odds Ratios than the other. There are two exceptions: ADL limitations and Homelessness. The indicator of needing personal care assistance (i.e., ADL limitations) is somewhat lower among those receiving IHSS at HCBS entry (Model 2) compared to those in Model 1. Included in this sample are those who did not receive IHSS at entry or even later in the observation year. One might speculate that receiving IHSS may have reduced the risk of NF placement. Homelessness, on the other hand, is likely not a situation that is readily accessible to home care, so it is logical that homeless persons have a higher risk of NF placement.

Propensity Scores for NF entry: From our models, we calculated a propensity score, i.e. the predicted probability of nursing facility entry for each SPD based upon their characteristics. Using the aggregated propensity scores for each county, we then calculated county-level expected rates of use. These scores were subsequently used in a county-level analysis comparing observed rates of nursing facility use with expected rates of use.

Table A-4
Predicting the Likelihood of Extended Nursing Facility Entry Among SPD Beneficiaries Who Have Entered a LTSS Program

	HCBS or NF Entrants			IHSS & NF Entrants Only[a]		
	N=31,849			N=26,720		
Independent Variables	Odds Ratio	p-value	95% CI	Odds Ratio	p-value	95% CI
Age (age <45 reference)						
45-54	1.34	***	1.22-1.48	1.37	***	1.24-1.51
55-64	1.81	***	1.66-1.99	1.87	***	1.70-2.06
65 or more	1.29	***	1.15-1.46	1.40	***	1.24-1.58
Female (y/n)	0.59	***	0.55-0.63	0.57	***	0.54-0.61
Race/Ethnicity[a]						
Hispanic	0.82	***	0.75-0.89	0.80	***	0.73-0.87
Black	0.77	***	0.71-0.83	0.67	***	0.61-0.73
Asian	0.66	***	0.58-0.74	0.63	***	0.56-0.71
Other	1.32	***	1.17-1.48	1.51	***	1.33-1.71
ADL Limitations	4.10	***	3.85-4.38	3.24	***	3.03-3.47
Cognitive Limitations	1.59	***	1.50-1.70	1.57	***	1.48-1.68
CDPS Score	1.04	**	1.01-1.06	1.12	**	1.09-1.15
CNS Condition	1.44	***	1.31-1.59	1.49	***	1.34-1.66
Psy Condition[f]	1.56	***	1.41-1.72	1.77	***	1.59-1.98
Substance Abuse[g]	1.35	***	1.23-1.48	1.43	***	1.29-1.59
Live Alone[h]	1.38	***	1.28-1.48	1.23	***	1.14-1.32
Homeless[i]	4.35	***	3.72-5.08	4.81	***	4.05-5.73
Generalized R^2	0.19			0.20		

p-value *** <.001 ** <.01

[a] IHSS use refers to those whose first HCBS entry was into IHSS (or within 90 days of entry into another HCBS program) within the observation year