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### Authors

Ko, Michelle  
Newcomer, Robert  
Kang, Taewoon  
[et al.](#)

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# Payment Rates for Personal Care Assistants and the Use of Long-Term Services and Supports among Those Dually Eligible for Medicare and Medicaid

*Michelle Ko, Robert Newcomer, Taewoon Kang, Denis Hulett, Philip Chu, and Andrew B. Bindman*

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**Objective.** To examine the association between payment rates for personal care assistants and use of long-term services and supports (LTSS) following hospital discharge among dual eligible Medicare and Medicaid beneficiaries.

**Data Sources.** State hospital discharge, Medicaid and Medicare claims, and assessment data on California Medicaid LTSS users from 2006 to 2008.

**Study Design.** Cross-sectional study. We used multinomial logistic regression to analyze county personal care assistant payment rates and postdischarge LTSS use, and estimate marginal probabilities of each outcome across the range of rates paid in California.

**Data Extraction Methods.** We identified dual eligible Medicare and Medicaid adult beneficiaries discharged from an acute care hospital with no hospitalizations or LTSS use in the preceding 12 months.

**Principal Findings.** Personal care assistant payment rates were modestly associated with home and community-based services (HCBS) use versus nursing facility entry following hospital discharge (RRR 1.2, 95 percent CI: 1.0–1.4). For a rate of \$6.75 per hour, the probability of HCBS use was 5.6 percent (95 percent CI: 4.2–7.1); at \$11.75 per hour, 18.0 percent (95 percent CI: 12.5–23.4). Payment rate was not associated with the probability of nursing facility entry.

**Conclusions.** Higher payment rates for personal care assistants may increase utilization of HCBS, but with limited substitution for nursing facility care.

**Key Words.** Long-term care, home care/nursing homes, Medicaid, Medicare, state health policies

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Individuals who are dually enrolled in Medicare and Medicaid have a high burden of disease and disability that often requires care in the form of long-term services and supports (LTSS). Medicaid is the primary payer for LTSS

for dual eligible enrollees, and in 2010, LTSS for dual eligible beneficiaries accounted for 24 percent of all Medicaid spending (Musumeci 2013). LTSS may be delivered in institutions such as nursing facilities, but in some cases, care in home and community-based settings may be more cost-effective and better aligned with beneficiary preferences.

A number of provisions in the Affordable Care Act aim to expand home and community-based services (HCBS) as an alternative to nursing facility care, including increasing the federal match rate to state Medicaid programs for personal care assistant services (Community First Choice option), expanding Medicaid eligibility for state plan and waiver programs, and enhanced federal matching rates for states to rebalance LTSS expenditures toward HCBS (Harrington et al. 2012). Policies that support the LTSS workforce, such as raising payment rates for personal care assistants, may boost the capacity of Medicaid programs to substitute HCBS for nursing facility use (Seavey and Marquand 2011; Kaye 2014).

Within Medicaid, low reimbursement rates can act as a barrier to HCBS access, with an inadequate number of providers willing to provide services (Harrington et al. 2002). Jobs in personal care services, whether in home or institutional settings, are typically characterized as poor in quality, with low wages, limited flexibility and minimal opportunity for advancement, and high rates of disability (Seavey and Marquand 2011). Low wage rates for personal care assistants in particular are cited as a major source of worker dissatisfaction, high turnover, and consequently, a shortage of high-quality providers (Seavey and Marquand 2011). Raising payment rates for personal care assistants in Medicaid may increase HCBS utilization by improving stability in the personal care workforce. Higher wages are associated with longer job spells and reduced turnover among those providing home health and personal care services (Baughman and Smith 2012; Butler et al. 2014).

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Address correspondence to Michelle Ko, M.D., Ph.D., Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco, 3333 California Street, Suite 265, San Francisco, CA 94143; e-mail: michelle.ko@ucsf.edu. Robert J. Newcomer, Ph.D., and Taewoon Kang, Ph.D., are with the Department of Social and Behavioral Sciences, School of Nursing, University of California, San Francisco, San Francisco, CA. Denis Hulett, M.S., Philip Chu, M.S., and Andrew B. Bindman, M.D., are with the California Medicaid Research Institute, University of California, San Francisco, San Francisco, CA. Andrew B. Bindman, M.D., is with the Philip R. Lee Institute for Health Policy Studies, University of California, San Francisco; Division of General Internal Medicine, San Francisco General Hospital, University of California, San Francisco, San Francisco, CA.

There may be elasticity in the supply of personal care assistants in response to payment rates, because a large proportion of care is provided by informal caregivers (Feinberg et al. 2011). A handful of states, including California, have historically allowed family members (e.g., spouses, children, siblings, and other relatives) to be reimbursed as personal care assistants through Medicaid HCBS. The use of paid family members is growing nationally as other states expand consumer-directed personal care programs that allow beneficiaries to choose their preferred care providers (Newcomer, Kang, and Doty 2012). Higher payment rates for personal care assistants may thus encourage use of HCBS by favorably offsetting lost wages associated with informal caregiving (Heitmuller and Inglis 2007). Increased investments in HCBS are associated with lower rates of informal caregiving (Stabile, Laporte, and Coyte 2006; Rice, Kasper, and Pezzin 2009). Thus, higher wages for personal care assistants may increase HCBS access by boosting the supply of formal providers, both relatives and nonrelatives.

It is not known whether higher reimbursement rates for personal assistants would impact the likelihood that beneficiaries would receive HCBS in lieu of institutional care. States that have increased investments in Medicaid HCBS programs have experienced declines in rates of nursing facility use among adults over 65, and spending on institutional care (Kaye, LaPlante, and Harrington 2009; Miller 2011). Alternatively, policies that increase access to HCBS, such as higher payment rates, may primarily expand use of LTSS among those in the community who would have otherwise foregone services. Growth in state HCBS expenditures has been accompanied by rising LTSS use among beneficiaries residing in the community (Kemper et al. 2008; Kane et al. 2013). To our knowledge, no study has empirically examined the relationships between payment rates for personal care assistants and use of Medicaid HCBS.

Although Medicaid is jointly administered by the federal and state governments, states retain control of provider payment rates, including those for personal care assistants delivering home and community-based services. In some states, including California, the state sets a base range, and then the counties determine payment rates within the limits established by the state. In California, counties (through the auspices of a Public Authority which functions as the “employer of record”) negotiate with the local union representatives to establish the prevailing rate (California Department of Social Services). There is some flexibility to account for caregiver experience and tenure. Thus, although the Medicaid eligibility criteria for HCBS are the same across California’s 58 counties, there is substantial within-state

variation in payment rates for personal care assistants (Newcomer et al. 2011). Some of the variation might be attributed to county differences in cost-of-living; but the demand for LTSS relative to the available supply of caregivers in a county can also influence the negotiated payment rates for personal care services.

In this study, we capitalize on the variation within a single state to examine the associations between payment rates for personal care assistants and the likelihood of receipt of HCBS among those dually eligible for Medicaid and Medicare. We hypothesize that after adjusting for differences in individual and county characteristics, the county payment rate for personal care services will be associated with:

1. *Increased likelihood of discharge to the community with home and community-based services.* We propose that counties with higher payment rates will have a greater availability of personal care assistants, thus increasing access to HCBS and likelihood of use.
2. *Decreased likelihood of discharge to nursing facilities.* Assuming that higher payment rates improve access to HCBS, and there remains unmet demand for LTSS provided in noninstitutional settings, we propose that some beneficiaries may elect to receive HCBS as an alternative to discharge to a nursing facility.

## METHODOLOGY

### *Data*

We used an existing dataset on beneficiaries of California's Medicaid program, known as Medi-Cal, who received a broad range of therapeutic and supportive services, including LTSS, from 2005 to 2008.<sup>1</sup> This dataset consists of linked data from multiple sources, including information on (1) LTSS utilization, enrollment, and demographic characteristics from Medicaid and Medicare fee-for-service claims and eligibility files; (2) hospitalizations and discharge diagnoses from the Office of Statewide Health Planning and Development Patient (OSHPD) Discharge Database, which captures all nonfederal hospitalizations in the state; and (3) functional limitations and living arrangement from LTSS assessment files, including the Case Management, Information and Payrolling System (CMIPS) for those receiving HCBS as In-Home Supportive Services; the Outcome and Assessment Information Set for those receiving home health; the Nursing Facility Minimum Data Set for those in

nursing facilities; and the Inpatient Rehabilitation Facility Patient Assessment Instrument data for those discharged to rehabilitation hospitals.

### *Study Sample*

For this study, we chose to examine adult beneficiaries dually eligible for Medicare and Medi-Cal because they are known as a population group to have a high need for LTSS. Furthermore, because the dataset was originally constructed to capture California's Medi-Cal beneficiaries predisposed to use LTSS, our sample is not representative of all dual eligibles, but rather a subset that may have a particularly high need for personal care and other supportive services (Stone et al. 2011).

From this subset, we were particularly interested in those who might receive LTSS following discharge from the hospital. We focused our analysis on events following hospitalization because Medi-Cal nursing facility admission in California is primarily limited to hospitalized beneficiaries. Medi-Cal beneficiaries are also eligible for HCBS following a hospitalization, but a hospitalization is not a requirement as it is for nursing facility admission (Newcomer et al. 2013). We thus identified beneficiaries discharged from the hospital in the period from 2006 to 2007. To reduce variability in preadmission health status, we limited our study sample to those with no hospitalizations in the prior 12 months. To improve comparability in preadmission functional status and experience with LTSS, we further restricted the sample to those with no use of nursing or rehabilitation facility services, or HCBS, in the prior 12 months.

We included only those beneficiaries who were dually eligible for Medicare and Medi-Cal at the time of discharge to reduce the likelihood that differences in receipt in LTSS could be attributable to differences in insurance coverage. We excluded those beneficiaries enrolled in Medicare or Medi-Cal managed care plans, because we did not have complete claims records for these recipients. We also excluded those with developmental disabilities and those ineligible for the full scope of Medi-Cal benefits (e.g., those whose eligibility was pregnancy related). To reduce unobserved heterogeneity among those who die shortly after hospital discharge (e.g., those for whom death is anticipated), we also excluded those who died within the same month of hospital discharge. We confirmed deaths through a combination of the eligibility files and state vital statistic records. After applying the inclusion and exclusion criteria, we identified 58,548 dual eligible Medicare and Medi-Cal beneficiaries residing in 56 of California's 58 counties with index hospitalizations in 2006 and 2007.

### *Dependent Variable*

We created mutually exclusive categories of outcomes following a hospital discharge: discharged to the community with no LTSS services, discharged to the community with receipt of HCBS, or entry into a nursing or rehabilitation facility. We defined HCBS from claims indicating receipt of any Medi-Cal home and community-based service. (Over 80 percent of HCBS recipients receive In-Home Supportive Services with the remainder receiving Adult Day Health Care, Home Health, Targeted Case Management, or HCBS waiver services; Newcomer et al. 2013). Nursing facilities included both Medicare and Medicaid reimbursed skilled nursing facilities and acute rehabilitation facilities. For an additional set of sensitivity analyses (see below), we further subdivided nursing facility stays into extended versus short. We categorized an admission as “extended” if it met any of the following criteria: length of stay equal to or greater than 21 consecutive days; or length of stay 20 days or less, during which time the individual was enrolled in Medicare, but Medicare did not pay during the stay. We assumed that “short” stays reimbursed by Medicare reflected a determination that the beneficiary required postdischarge rehabilitative care.

As there may be delays in initiating LTSS services following a hospital stay, we considered any claim for LTSS in the month of discharge or the month following discharge as an indicator of initiating LTSS. Under this definition, we identified a small number ( $N = 148$ ) of beneficiaries who received both HCBS and nursing facility care in the same month. In a few of these cases ( $N = 10$ ), the nursing facility admission met our definition of a “short” stay, that is, appeared to be for rehabilitative services, and we assumed the beneficiary received HCBS after discharge from nursing facility care (Newcomer et al. 2014). For the remaining majority ( $N = 138$ ), who were admitted to nursing facilities for an extended period, we assumed that HCBS preceded the nursing facility admission and we classified the individual as receiving HCBS posthospital discharge (Newcomer et al. 2014). We considered it less likely that within the span of 1 month, dual eligible beneficiaries would initially have an extended stay in a nursing facility, followed by HCBS.

### *Independent Variables*

We measured personal care assistant payment rate using the county median hourly wage rate for In-Home Supportive Services personal assistants derived from the Case Management, Information and Payrolling System (CMIPS).

We additionally controlled for a number of individual and area-level characteristics that could confound the association between personal assistant payment rates and use rates of LTSS. Our individual-level measures derived from Medi-Cal eligibility files include age at discharge, gender, race, or ethnicity (African American, Asian, Hispanic, white, or other), and Medi-Cal aid (or eligibility) code, which indicates whether an individual was categorically eligible for Medi-Cal (e.g., aged or disabled) or became eligible as Medically Needy on the basis of having health care expenditures that lowered the individual's functional income below the eligibility threshold. We measured health status by calculating the Chronic Illness and Disability Payment Score (CDPS) for all diagnoses reported at discharge in the OSHPD Patient Discharge database (Kronick et al. 2000). Due to the skewed distribution of the CDPS within our sample, we used the log transformation of the CDPS score in our analyses. We categorized functional limitation derived from the LTSS assessment files as fewer than three limitations in activities of daily living versus three or more. Of note, assessments on functional limitations and living arrangements are performed only when clinicians (by request or per clinical judgment) seek to determine whether a Medi-Cal beneficiary is eligible for LTSS. Beneficiaries discharged without an ADL assessment were thus considered for analytic purposes to have fewer than three limitations. We categorized living arrangement as a dichotomous indicator of whether the individual lived alone or with others.

At the county level, we controlled for nursing facility supply by constructing an estimate of the number of nursing facility beds available to beneficiaries with Medi-Cal coverage. First, we obtained data on nursing facility beds from the Electronic Licensing Management System from the California Department of Public Health. We weighted the number of beds in each facility by the percentage of days paid by Medi-Cal, and then summed the total number for each county. We then calculated the Medi-Cal nursing bed supply per 1,000 county residents. We also included measures of the county total population to adjust for overall demand for medical services and percentage of population greater than 65 to account for demand for Medicare services, obtained from the State Department of Finance (2011). Finally, we included the county median household income, to account for differences in the local cost-of-living and demand for health care services (2011). All county characteristics were measured for the years of 2006 and 2007, and linked to beneficiary data for the year of hospital discharge.



### *Analysis*

We employed multinomial logistic regression to estimate the associations between county payment rate for personal care assistant services and postdischarge outcomes, controlling for other individual and county characteristics. In our models, we designated entry into a nursing facility as the reference outcome. The estimated relative risk ratios thus reflect the associations between the independent variables and the alternate outcomes, HCBS, or community, relative to nursing facility entry. This approach provides insights into whether county payment rates are associated with HCBS substitution for nursing facility care. To understand how county personal assistant payment rates may be associated with overall LTSS use, we then estimated the marginal predicted probability of each outcome (HCBS, nursing facility, community), for every one-dollar increase in hourly personal assistant payment rate. We estimated probabilities across the range of personal assistant payment rates observed within California for the study period. We estimated models using county-clustered robust standard errors to account for within-county correlation.

We also conducted a number of sensitivity analyses to assess the robustness of our results. Because the service area for nursing facilities may be larger than a single county, we estimated models in which we substituted county nursing facility bed supply with a measure of nursing facility bed supply for multicounty regions (eight regions, Office of Statewide Health Planning and Development). We also performed analyses in which we restricted the nursing facility outcomes to only those who entered nursing facilities for an extended stay, not those admitted a shorter rehabilitative stay.

Lastly, as noted above, assessment data on functional status and living arrangement are generated only when a beneficiary is formally evaluated for Medi-Cal LTSS eligibility. In our sample, complete assessment data were available for only 43.7 percent ( $N = 25,765$ ) (see Table A1, Appendix A for detailed descriptive characteristics of the complete case sample). We designated those with missing functional limitation information as fewer than three ADL limitations, as described above. However, due to the high rate of missing data, we were unable to include our measure of living arrangement in our models with the full study sample. We thus repeated our analyses on the subsample with complete assessment data and included living arrangement in these models.

*Stata 13* (StataCorp, College Station, TX) was used to perform all analyses. The study was reviewed and approved by the University of California San Francisco Committee on Human Research and the California Committee for the Protection of Human Subjects.

## RESULTS

Following inpatient hospitalization, the majority (66.7 percent) of dual eligible beneficiaries were discharged to community settings with no LTSS services (Table 1). Among those discharged with LTSS, a greater percentage entered nursing facilities (23.8 percent) than initiated HCBS (9.5 percent). Of those who entered nursing facilities, approximately one-third ( $N = 5,632$ ) had a short stay and two-thirds ( $N = 8,308$ ) were admitted for an extended stay.

Those who were discharged to the community without LTSS were on average younger and more often female. Those who received HCBS were more often nonwhite and categorically eligible for Medi-Cal under the Aged qualification. Those who entered nursing facilities had a poorer health status (higher CDPS score) and were more likely to experience three or more limitations in activities of daily living.

For counties represented in the study population, the median caregiver payment rate ranged from \$6.75 to \$11.75 per hour. The county Medi-Cal nursing bed supply ranged from 2.3 to 8.9 beds per 1,000 residents. Beneficiaries who received HCBS upon discharge resided in counties with higher household incomes, total population, and higher caregiver payment rates. Beneficiaries who were discharged to the community without LTSS resided in counties with lower household incomes and lower caregiver payment rates.

In multivariate analyses, county median personal assistant payment rate was associated with a higher likelihood of receipt of HCBS versus entry into a nursing facility (RRR 1.2,  $p = .008$ ), adjusting for individual and other county factors (Table 2). The personal assistant payment rate was also associated with a lower likelihood of discharge to the community versus nursing facility entry (RRR 0.87,  $p = .026$ ). Medi-Cal nursing facility bed supply was not associated with outcomes.

When we estimated the marginal probability associated with each outcome, we found that increasing personal assistant payment rate was associated with higher likelihood of receipt of HCBS and lower likelihood of discharge to the community without LTSS (Figure 1). For example, the predicted probability of receipt of HCBS following hospital discharge was 5.6 percent (95 percent CI: 4.2–7.1) for a payment rate of \$6.75 per hour, versus 18.0 percent (95 percent CI: 12.5–23.4) for a payment rate of \$11.75 per hour. Conversely, the predicted probability of discharge to the community without LTSS was 72.0 percent (95 percent CI: 69.0–75.0) in counties with a personal assistant

Table 1: Characteristics of California Dual Eligible Medicare and Medi-Cal Beneficiaries, by Posthospital Discharge Outcome

	<i>Total</i> ( <i>N</i> = 58,548)	<i>HCBS</i> 9.5% ( <i>N</i> = 5,585)	<i>Nursing Facility</i> 23.8% ( <i>N</i> = 13,940)	<i>Community</i> 66.7% ( <i>N</i> = 39,023)
<b>County characteristics</b>				
Median hourly personal assistant payment rate	8.9 (1.06)	9.09 (1.07)	8.99 (1.05)	8.86 (1.05)
Number of Medicaid nursing home beds/1,000 residents	2.3 (0.67)	2.39 (0.63)	2.32 (0.66)	2.32 (0.68)
% aged 65+	10.8 (1.90)	10.95 (1.84)	10.84 (1.92)	10.82 (2.04)
Median household income (in thousands)	54.4 (10.4)	55.6 (10.2)	55.2 (10.3)	53.9 (10.4)
Total population (in 100 thousands)	409.4 (412.5)	448.6 (419.8)	414.4 (409.7)	402.1 (412.5)
<b>Individual characteristics</b>				
Age (years)				
18 to <45	5.9	4.8	1.9	7.6
45 to <65	20.6	15.3	13.9	23.8
65 to <85	62.4	67.7	64.7	60.7
85+	11.1	12.2	19.5	7.9
Gender				
Female	57.2	62.9	60.0	55.3
Race/ethnicity				
Non-Hispanic white	39.0	26.3	47.6	37.8
Hispanic	29.7	30.9	24.4	31.4
Black	8.0	9.9	7.4	8.00
Asian	16.4	25.8	13.6	16.0
Other*	6.9	7.1	7.0	6.8
Aid code				
Medically needy	27.5	21.3	31.7	26.9
Aged	37.0	46.1	38.7	35.0
Disabled	34.6	32.6	26.2	37.9
Other	0.9	0.05	3.4	0.2
Health status				
CDPS score <sup>†</sup>	1.96 (1.39)	2.01 (1.36)	2.38 (1.58)	1.80 (1.28)
Functional status				
<3 ADL limitations	77.9	70.6	30.8	95.7
3+ ADL limitations	22.1	29.4	69.2	4.3

*Note.* *N* = 58,548. HCBS: Home and community-based services. Nursing Facility: Entry into a skilled or rehabilitative nursing facility. Community: Discharged without long-term supports services. Values on county characteristics indicate mean (standard deviation). Values on individual characteristics indicate % for categorical variables and mean (standard deviation) for continuous variables.

\*Other includes Native Alaskan/American Indian/Mixed/Other/Unknown race/ethnic groups.

<sup>†</sup>Chronic Illness and Disability Payment System: CDPS is a risk-based model developed for capitated payments to health plans that enroll Medicaid beneficiaries (Kronick et al. 2000). The score is based on weights associated with specific diagnoses, age, and gender. The resultant scores are counts of chronic conditions weighted by severity, such that a higher score indicates greater morbidity. Conditions not included in the CDPS categories are given a weight of zero.

Table 2: Associations between County Characteristics and Posthospital Discharge Disposition, Relative to Discharge to Nursing Facility, Adjusted for Individual Characteristics

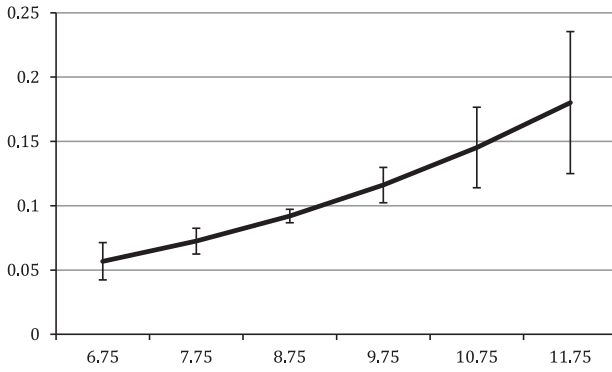
	Reference Outcome: Nursing Facility (N = 13,940)			
	HCBS (N = 5,585)		Community (N = 39,023)	
	RRR	95% CI	RRR	95% CI
County				
Median hourly personal assistant payment rate	1.19**	(1.05–1.36)	0.88*	(0.78–0.98)
Number of Medicaid nursing home beds/1,000 residents	1.02	(0.89–1.16)	0.97	(0.86–1.08)
% aged 65+	1.07**	(1.03–1.11)	0.99	(0.97–1.02)
Median household income (in thousands)	1.00***	(1.00–1.00)	1.00	(1.00–1.00)
Total population (in 100 thousands)	1.00	(1.00–1.00)	1.00	(1.00–1.00)
Age (ref 65 to <85)				
18 to <45	2.30***	(1.90–2.77)	2.90***	(2.41–3.50)
45 to <65	1.21**	(1.07–1.39)	1.66***	(1.52–1.81)
85+	0.87***	(0.77–0.97)	0.74***	(0.67–0.82)
Gender				
Female	1.19***	(1.12–1.27)	0.88***	(0.83–0.93)
Race/ethnicity (ref Non-Hispanic white)				
Hispanic	2.54***	(2.29–2.82)	1.90***	(1.76–2.06)
Black	2.40***	(2.08–2.78)	1.37***	(1.22–1.53)
Asian	3.53***	(2.86–4.36)	2.08***	(1.71–2.52)
Other	1.79***	(1.43–2.24)	1.54***	(1.33–1.79)
Aid code (ref Medically Needy)				
Aged	1.56***	(1.36–1.76)	1.14**	(1.06–1.24)
Disabled	1.54***	(1.35–1.76)	1.20*	(1.03–1.41)
Other	0.04***	(0.01–0.13)	0.19***	(0.12–0.30)
Health status				
Log CDPS Score	0.78***	(0.69–0.88)	0.62***	(0.57–0.67)
Functional status				
3+ ADL limitations	0.21***	(0.17–0.25)	0.02***	(0.02–0.03)

Note. Results presented are relative risk ratios (RRR) with 95% confidence intervals. \**p* < .05; \*\**p* < .01; \*\*\**p* < .001.

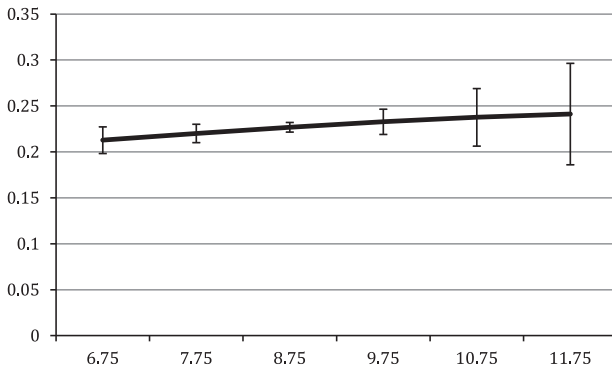
payment rate of \$6.75 per hour versus 57.2 percent (95 percent CI: 51.7–62.6) for the counties with a payment rate of \$11.75. There was no significant trend between personal assistant payment rate and predicted probability of nursing facility entry.

When we restricted nursing facility outcomes to only those with extended stays, thus comparing HCBS and community to those who likely

(a) Discharge with home and community-based services (HCBS)



(b) Discharge to nursing facility



(c) Discharge to the community without long-term supports or services (LTSS)

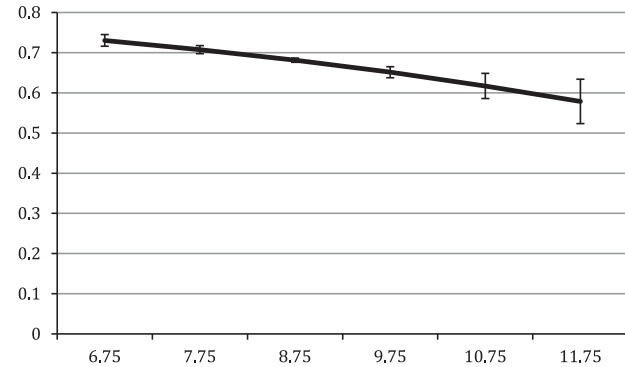


Figure 1: Predicted Probability of Posthospital Discharge Disposition, by Hourly Personal Care Assistant Payment Rate, Adjusting for Other County and Individual Characteristics. The *Y*-axis represents the marginal probability as a proportion of 1, that is, 0.05 corresponds to 5 percent; the *X*-axis represents the payment rate in dollars, that is, 6.75 corresponds to \$6.75 per hour

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received custodial care, our findings for personal assistant payment rate were essentially unchanged (HCBS: RRR 1.7,  $p = .026$ ; community: RRR: 0.86,  $p = .046$ ) (see Table B1, Appendix B for full results).

For the subsample with complete assessment data, our outcomes as expected reflected higher rates of LTSS use upon discharge: 18.1 percent received HCBS, 47.9 percent entered nursing facilities, and 34.0 percent were discharged to the community without LTSS. When we repeated our analyses, including the measure of living arrangement, we found the direction and magnitude of association between personal assistant payment rate and receipt of HCBS, versus entry into a nursing facility, was similar but the significance was reduced (RRR 1.17,  $p = .056$ ). However, the marginal probability of receipt of HCBS associated with increasing personal assistant payment rate remained similar and still significant. For this sample, the predicted probability of receipt of HCBS following hospital discharge was 11.7 percent (95 percent CI: 8.5–14.8) for a payment rate of \$6.75 per hour, versus 29.1 percent (95 percent CI: 20.7–37.4) for a payment rate of \$11.75 per hour. The predicted probability of discharge to the community without LTSS was 42.5 percent (95 percent CI: 34.9–50.2) versus 22.9 percent (95 percent CI: 16.2–29.6). There was no significant trend association between county payment rate and predicted probability of nursing facility entry. In all sensitivity analyses, Medi-Cal nursing bed supply was not associated with outcomes.

## DISCUSSION

In support of our first hypothesis, we found that upon discharge from the hospital, dual eligible beneficiaries in counties with more generous personal assistant payment rates are more likely to receive HCBS. However, we find minimal evidence to suggest that payment rates support receipt of HCBS as an alternative to nursing facility use.

Our findings are consistent with prior research that has found that state investments in HCBS are only partially offset by declines in use of nursing

facilities and expenditures (Eiken, Burwell, and Sredl 2013; Kane et al. 2013). Higher HCBS expenditures are associated with shifts in nursing home case mix toward residents with higher level needs, suggesting that expanding HCBS increases options for those with lower acuity needs (Hahn et al. 2011). However, overall substitution effects are likely modest because the number of beneficiaries with low acuity nursing facility needs is relatively small (Kane et al. 2013). In our study sample, the percentage of nursing facility residents with three or more ADL limitations exceeded 70 percent, whereas among those who received HCBS, more than 70 percent had fewer than three ADL limitations.

Instead, policies that facilitate access to HCBS, such as raising personal assistant payment rates, may enable those in community settings to obtain LTSS. We found across all models that county payment rate was positively associated with higher likelihood of receipt of HCBS, and lower likelihood of discharge to the community without LTSS. Our findings are consistent with studies that have found a reduction in LTSS utilization associated with payment reductions for skilled nursing and home health services (McKnight 2006; Buntin, Colla, and Escarce 2009; Fitzgerald, Boscardin, and Ettner 2009; Grabowski, Afendulis, and McGuire 2011; Huckfeldt et al. 2014). Changes in utilization as a result of payment reforms may be partly attributed to corresponding shifts in provider supply. Following cuts in Medicare home health reimbursement, the supply of home health agencies contracted as more providers exited and fewer new providers entered the market (Choi and Davitt 2009; Huckfeldt et al. 2013).

We are unable to determine whether the increased likelihood of receipt of HCBS reflects appropriate use of services. Increasing payment rates may improve access to needed services; or alternatively, may encourage overuse (known as the “woodwork effect”) with limited long-term health and welfare benefits. Recent estimates of Medicaid LTSS use suggest that on a national level, the “woodwork effect” in HCBS accounted for only 0.7 percent of growth in the number of Medicaid LTSS users; expansions in Medicaid LTSS appear to be primarily driven by the growing population with functional limitations (Eiken, Burwell, and Sredl 2013). This would suggest that increasing personal assistant payment rates may help to fulfill unmet need for LTSS, by increasing access to HCBS, but it is beyond the scope of this study to make that determination across California counties.

### *Limitations*

This study has several limitations related to the data available for our analyses. First, our study reflects the experiences of California beneficiaries and may not be applicable to other states. However, we contend our findings remain informative to policy makers because California, in the time of the study period, was engaged in practices to rebalance LTSS expenditures toward HCBS, as is now encouraged for all states through the ACA. For example, California was initially one of a few states that allowed individuals, that is, “independent providers,” to provide personal assistant services, but states’ HCBS programs have increasingly adopted beneficiary-directed policies that allow recipients some discretion in selecting personal care providers (Newcomer, Kang, and Doty 2012). Payment rates may be particularly salient as barriers to entry in the personal care labor force are lowered. Furthermore, by examining within-state variation, we avoid the challenges of attempting to study the impact of personal care assistant rates across states with considerable variability in HCBS eligibility and programs (Kaye 2014).

Second, we were unable to account for more detailed measures that capture a beneficiary’s need for LTSS, such as family and social support. In particular, those discharged to the community without LTSS are unlikely to receive an LTSS eligibility assessment, and so our sample contained a very high rate (over 75 percent) of missing data on functional limitations and living arrangement. Muramatsu et al. (2007) found that residence in a state with higher expenditure HCBS was associated with reduced nursing facility admissions, but only among seniors without children; there was no effect for those who reported having living children. In our models that were restricted to those with complete assessment data (who exhibited lower health and functional status), the association between payment rates and HCBS use, relative to nursing facility entry, was no longer significant. However, our estimates for overall probability of HCBS use were consistent.

Third, our outcome measures are limited to LTSS use following hospital discharge. Although this represents a common entry point for initiating LTSS, the majority of dual eligible beneficiaries who receive HCBS do not have a hospitalization in the month prior to the start of services (Newcomer et al. 2014). Because hospital discharges are also influenced by other system factors, such as the strength of relationships between hospitals and postacute care facilities (Buntin et al. 2005), the impact of personal care assistant payment rates may be underestimated for those initiating HCBS from community settings. At the end of life, residence in a state with higher HCBS expenditures is asso-



ciated with a lower likelihood of permanent relocation to nursing homes (Muramatsu et al. 2008).

Fourth, we did not directly assess the county supply of personal care assistants, in relation to county payment rates. We would expect this relationship to be positive, as increases in wage rates are associated with declines in home health and personal care aide turnover (Seavey and Marquand 2011). Over time, the growth in the personal assistance workforce has increased in parallel with Medicaid expenditures in HCBS (Kaye et al. 2006). One challenge to the measurement of the long-term care workforce is the high prevalence of informal caregiving provided by family members (Seavey and Marquand 2011). Additional exploration is needed to understand the effects of increasing payment rates on HCBS use among those with family members who may potentially provide personal care assistant services.

Finally, the study design is cross-sectional and the corresponding results are associations; causal inference cannot be derived from the findings.

## CONCLUSION

The Affordable Care Act contains a number of provisions to both expand access to HCBS and encourage states to rebalance LTSS expenditures toward HCBS. Studies that examine the HCBS expenditures, particularly across states, are unable to account for differences in programs and target populations, and conclusions about “effects” of HCBS are limited to generalizations about total investments. Our study adds to the existing literature by providing insight on a specific policy, personal care assistant payment rates, that may be pursued by states to encourage use of HCBS. Our findings suggest that these efforts may increase use HCBS, which may benefit those living in the community, but not necessarily result in a large reduction in nursing facility use. Further investigation is needed to determine whether increases in HCBS use yield a positive impact on long-term outcomes, such as declines in hospitalizations and nursing facility admissions, as well as reductions in total health care expenditures.

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*Disclaimers:* None.

## NOTE

1. Because Medicaid does not have a single eligibility code to identify beneficiaries receiving LTSS, investigators from the California Medicaid Research Institute initially compiled a broad list of therapeutic and support services that could be classified as LTSS or likely to be used by LTSS recipients. Thus, in addition to the home and community-based services and institutional services traditionally considered as LTSS, this list also included services such as Durable Medical Equipment, Home Health, Occupational/Physical/Speech Therapy, and Prosthetics/Orthotics (Stone et al. 2011). The original study cohort was selected by identifying beneficiaries with Medi-Cal claims for any of those services in the period 2005–2008.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.

Appendix SA2: Appendices A and B.