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Severity of Inpatient Hospitalizations Among Undocumented Immigrants and Medi-Cal Patients in a Los Angeles, California, Hospital: 2019.

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1 **Examining the Severity of Inpatient Hospitalizations**
2 **among Undocumented Patients in a Los Angeles Hospital, 2019**
3

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10 **Abstract**

11 Objective: To compare the severity of inpatient hospitalizations between undocumented
12 immigrants and Medi-Cal patients in a large safety-net hospital in Los Angeles.

13 Methods: We conducted a retrospective analysis of all 2019 inpatient stays at a Los Angeles
14 hospital (n=22,480), including patients of all races/ethnicities. We examined three measures:
15 illness severity, length of hospital stay, and repeat hospitalizations, using insurance status to
16 approximate immigration status. We calculated group differences between undocumented and
17 Medi-Cal patients using inverse probability weighted regression adjustment separately for
18 patients 18-64 and those 65 years and older.

19 Results: Younger undocumented patients had less severe illness and shorter lengths of stay than
20 their Medi-Cal counterparts. Older undocumented immigrants also had less severe illness, but
21 had similar lengths of stay and were more likely to have repeated hospitalizations.

22 Conclusions: While existing work suggests that undocumented immigrants could have more
23 severe health care needs on account of their poorer access to medical care, we do not see clear
24 health disadvantages among hospitalized undocumented immigrants, especially younger patients.
25 There are fewer differences between undocumented and Medi-Cal patients who are older.

Introduction

There is growing interest in how immigration status affects the health care access and utilization of 10.5 million undocumented immigrants¹ in the United States. Undocumented immigrants have significantly lower levels of insurance coverage, lower use of the emergency room, and are less likely to have a usual source of care compared to both their documented counterparts as well as the US-born.^{2,3} These disparities are due to lower household incomes and ineligibility for Medicaid and Medicare, as well as lack of private insurance from employers. Even when health care are available, undocumented immigrants may be reluctant to access it due to the fear of deportation for themselves or their families.^{4,5} Undocumented immigrants also face challenges accessing the limited care that is available to them due to economic barriers and unfamiliarity with the health care system.⁶

Despite worse access to and lower utilization of health care, undocumented immigrants do not seem to have widespread negative physical health. In a review of 45 studies, Hamilton et al.⁷ found that the large majority did not observe undocumented immigrants to have significantly worse health than their documented counterparts. In some studies, undocumented immigrants actually seemed to have better health outcomes for conditions such as blood pressure, hypertension, asthma, and self-reported chronic conditions. A nationally representative sample confirmed the diverging trends between health insurance coverage and health status: Ro and Van Hook⁸ found that undocumented immigrants had lower odds of being currently insured but also had lower odds of disability and poor/fair self-rated health compared to the US-born.

While undocumented immigrants' limited health care access and robust physical health patterns may appear contradictory, these findings rely on self-reported health status in surveys

and may capture their health care utilization when individuals are relatively healthy. Undocumented immigrants tend to be younger than their documented counterparts,⁸ suggesting that some chronic health conditions may not have yet emerged or have not reached the point of requiring serious medical intervention. Undocumented immigrants are also more likely to be positively selected on health, given the costs and risks inherent in unauthorized migration.⁹ Undocumented immigrants' younger age and positive health selection may buoy their general health status, and as a result, they may not seek regular medical care.

What is unknown, however, is the health status of undocumented immigrants when they reach the point of needing intensive medical care and their health needs when they are in close contact with the health care system. As immigrants stay longer in the United States, their positive health advantage erodes.¹⁰ In the case of undocumented immigrants, initial health advantages can obscure longer-term care needs as their health deteriorates over time. In the general population, those who are uninsured or do not have regular medical care are more likely to enter the health care system in poorer health and have worse outcomes for both overall health and specific diseases.¹¹ Given their overall lack of medical care access, it is possible that undocumented immigrants will display poorer health outcomes than other groups when they are at the point of needing higher level care. Moreover, consistent underutilization of preventive services may leave them with more advanced stages of disease when they eventually need medical attention.

The extant literature has provided only limited or dated information on this topic. One study found uninsured undocumented immigrants hospitalized in Florida to have higher Case-Mix index (a measure of disease severity) but shorter hospital stays than immigrants with legal status.¹² Among patients in select cities in California and Texas, undocumented immigrants had the same levels of hospitalizations as documented immigrants, with the exception of childbirth.¹³

Treatment of End Stage Renal Disease (ESRD) among undocumented immigrants has been widely studied as an example of a life-threatening condition that requires intensive medical treatment but is highly mediated by access to health care. Undocumented immigrants with ESRD are more likely to receive emergency-only hemodialysis than standard hemodialysis,¹⁴ which is associated with increased mortality, health care utilization, and costs.^{15,16}

In this study, we explore the severity of hospitalizations among undocumented immigrants of all races/ethnicities who have required inpatient stays at the largest-safety net hospital in Los Angeles County. LA County has the largest population of undocumented immigrants country; there are nearly 880,000 undocumented immigrants, representing a wide number of countries of origin.¹⁷ We use insurance status to approximate immigration status, leveraging the county's unique health plans for undocumented immigrants to accurately estimate the likely undocumented population. Addressing this knowledge gap will reveal potential unmet needs of undocumented immigrants in the hospital setting during critical periods of illness, as well as possible disparities in inpatient health care.

Methods

Sample

The study was a retrospective analysis of all inpatient stays at Los Angeles County + University of Southern California (LAC+USC) Medical Center from January 1, 2019 to December 31, 2019. We merged two data sources: the LAC+USC internal electronic medical records system using Cerner PowerInsight and Vizient Health System Data, a hospital billing and administrative claims database. All data were de-identified to conform to Health Insurance Portability and Accountability Act (HIPAA) requirements. This study was deemed exempt by the USC Institutional Review Board.

We examined the data at both the encounter and patient level. For encounter data, there were 29,765 total inpatient hospitalizations at LAC+USC in 2019. We limited the sample to hospitalizations with patients 18 years of age and older and who were full-scope Medi-Cal patients (California's Medicaid program) or undocumented (coding detailed below). Our final analytic sample consisted of 22,480 inpatient encounters. In our analyses, we separated the sample by age (18-64 years and 65 years and older) because of differences in health status at older ages and public insurance coverage (18-64 years=18,244; 65 years and older=4,236). For the older adults, we limited the sample to those who only had Medi-Cal or a combination of Medi-Cal and Medicare to better isolate a low-income comparison group. For outcomes that used patient-level data (e.g. unique number of patients who were admitted to LAC+USC in 2019), there were 15,876 patients (18-64 years=12,910; 65 years and older=2,966).

Variables

Outcomes. We examined three outcomes indicating the severity of the hospitalization: illness severity, length of hospital stay, and repeat hospitalization.

Illness severity was measured by the relative risk of mortality, which was calculated by a proprietary algorithm that predicts the risk for mortality based on patient demographics, clinical characteristics, procedures, and co-morbidities for each Medicare Severity-Diagnosis Related Group (MS-DRG). For example, the risk prediction for a liver transplant (MS-DRG 5 or 6) was a function of hemodialysis, cachexia, complication of transplanted organ/tissue, ventilator on admission day, and Type II Diabetes. The risk for mortality was averaged over all encounters in the hospital for each diagnosis group in 2019. Encounters that were 75% of the mean were coded "lower risk" relative to the mean. Encounters that were within 75% and 125% of the mean were coded "similar risk" and encounters more than 125% of the mean were considered "higher risk".

We dichotomized the outcome to hospitalizations lower or similar to the mean versus those with higher risk of mortality.

Length of hospital stay was the total number of days of the inpatient admission, with longer encounters indicating sicker patients. This was an encounter-level variable, meaning that each hospitalization had its own length of stay. To account for outliers, we conducted additional analyses with encounters longer than 21 days removed.

Repeat hospitalization was a patient-level variable and was dichotomized to patients who had one inpatient admission in 2019 versus those who had more than one admission. We assumed those with more than one admission were sicker and needed more comprehensive care. Though it is possible that repeated hospitalizations might be due to unrelated/isolated events (e.g. injuries), it is more likely that repeated hospitalizations result from unresolved/ongoing illness.

Immigration Status. We compared undocumented immigrants to full-scope Medi-Cal patients using insurance status as a proxy to determine immigration status. We coded a patient as having undocumented status if the primary insurance for the encounter was restricted-scope Medi-Cal, which provides health services to low-income Los Angeles County residents who meet the income threshold for Medi-Cal but do not meet immigration status requirements as either US nationals, citizens, or lawful permanent residents. These services include access to county facilities that provide preventive, emergency, diagnostic, specialty, inpatient, and pharmacy services, as well as a local health care program (My Health LA), that offers primary and preventive health care services through community clinic partners.¹⁸

Given the income requirement for restricted-scope Medi-Cal eligibility, we chose full-scope Medi-Cal (hereafter referred to as Medi-Cal) patients as a comparison group of low-income patients who are either US-born or foreign-born with authorized status. Because of the

citizenship requirements for federal health insurance, nearly all of the Medi-Cal patients are either US-born or documented. The other option for a comparison group is individuals on other forms of insurance (e.g. private insurance), but we do not know either the poverty level or the immigration status of these patients.

Covariates. We included age as a continuous variable, race/ethnicity (Hispanic (ref.), non-Hispanic White, non-Hispanic Black, non-Hispanic Asian, non-Hispanic other), language (English (ref.), Spanish, other), gender (male (ref.), female), homeless status (housed (ref.), non-housed). We include language preference to account for reduced English proficiency that can impact treatment utilization and quality.¹⁹ As the primary safety net hospital in the county, LAC+USC has a substantial homeless patient population. We include homeless status to account for the substantial barriers to regular medical care that unhoused individuals face, as well as their complex health conditions.²⁰ For encounter-level outcomes, we included an indicator of whether the encounter was the only admission for the patient in 2019 (ref.) or if it was a repeat hospitalization. For instance, if an encounter was one of two or more hospitalizations from a patient in 2019, all encounters from that patient were coded “1”. If an encounter was the only hospitalization from a patient in 2019, it was coded “0”.

Analysis

Because of the inherent compositional differences between undocumented and Medi-Cal patients, we estimated group differences in our outcomes of interest using inverse probability weighted regression adjustment (IPWRA). This approach weights observations based on the inverse of their conditional probability of “treatment” exposure (i.e., being undocumented). The “treatment” model is estimated first, and the predicted probability of being “treated” (ie,

undocumented) is used to compute the inverse-probability weights. These weights are then applied to the outcome models (ie, illness severity, length of stay, repeat admission), creating a pseudo-matched sample, such that undocumented and Medi-Cal patients are balanced in their covariates. In conventional multivariate regression analysis, covariates are included in the model to account for compositional differences but each observation is weighted equally. In IPWRA models, observations that have a higher likelihood of being “treated” (ie, undocumented) are up-weighted while those that have lower likelihood are down-weighted. IPWRA is also known as the doubly-robust method because it models both the outcome and propensity for “treatment” within the same framework and only one needs to be correctly specified in order to produce unbiased results.²¹

Each weighted outcome model is run on the undocumented group first and then the comparison group. We calculated average treatment effects (ATE), a common post-estimation approach for treatment effects models such as the IPWRA,²² for each of our outcomes. The ATE take a counterfactual approach and assume that each subject has a pair of potential outcomes: the outcome if they were undocumented or the outcome if they were on Medi-Cal. The predicted means (POM) for the outcome is calculated for each observation assuming they are undocumented (using their own covariate values) and then again for each observation assuming they are on Medi-Cal. For each observation, the difference between the undocumented POM and Medi-Cal POM is called the effect of “treatment”. This difference is averaged across the entire population to calculate the ATE.

For the “treatment” model (i.e., undocumented versus Medi-Cal), we included age, race, language, gender and homeless status as predictors of undocumented status. For the outcome models (i.e., illness severity, length of stay, repeat admission), we included the same covariates

as the “treatment” model as well as whether the encounter was a repeat hospitalization for the illness severity and length of stay outcomes. For illness severity and repeat admissions, we conducted logistic regressions, whereas for length of stay, we conducted a linear regression model. We calculated robust standard errors to correct for potential for heteroskedasticity. We did this separately for patients 18-64 versus 65 years and older. We conducted our analyses using Stata v16.²³ We provide the coefficients for the IPWRA models in the supplemental material.

Results

Descriptives

Table 1 provides descriptive information for our sample at the encounter level. The same descriptive statistics at the patient level are provided in Supplemental Table 1. Nearly one-third of encounters were from undocumented patients (31.6%). The mean age for younger undocumented patients (18-64) was 45.8 for undocumented patients and 41.6 for Medi-Cal patients. Among older patients (65+ years), the mean age was 73.1 for undocumented and 73.8 for Medi-Cal. Undocumented patients in both age groups were predominantly Hispanic (18-64 years: 91.8% vs. 65+ years: 86.5%). Medi-Cal patients in both age groups were also predominantly Hispanic, but comprised a lower proportion (18-64 years: 62.5% vs. 65+ years: 57.2%).

Undocumented patients primarily spoke Spanish (18-64 years: 82.5%; 65+ years: 84.8%), whereas Medi-Cal patients had differences in language preference according to age group. Notably, homelessness was nearly three-fold greater among Medi-Cal patients compared to undocumented patients across age groups (18-64 years: 18.8% vs. 6.6%; 65+ years: 13.3% vs. 4.8%).

Compared to Medi-Cal patients, undocumented patients had lower illness severity and average length of stay. Among younger patients, 8.6% of undocumented patients had higher than average relative mortality risks compared to 11.2% of Medi-Cal patients. Among older patients, 15.8% of undocumented patients had higher than average mortality risk compared to 23.1% of Medi-Cal patients. The average length of stay in the hospital was 4.6 days for undocumented and 6.1 days for Medi-Cal among younger patients and 5.2 days and 6.8 days, respectively, among older patients. Among younger patients, inpatient encounters over the study period were comparable between undocumented and Medi-Cal patients, in which approximately 70.7% were first encounters and 29.1% were repeat hospitalizations. However, among older patients, undocumented patients had more repeat hospitalizations compared to Medi-Cal patients (34.8% vs. 24.8%).

Group Differences in Inpatient Measures

The results of the IPWRA are presented in Table 2. For patients 18-64 years of age, encounters with undocumented patients had lower illness severity and shorter lengths of stay than encounters with Medi-Cal patients. The probability of having an encounter with a higher-than-average risk for mortality was 8.4% for undocumented patients and 11.6% for Medi-Cal patients. Encounters from undocumented patients therefore had 3.2% lower probability of a higher-than-average mortality risk compared to encounters from Medi-Cal patients. The average length of stay for encounters from undocumented patients was 1.1 days shorter than for Medi-Cal patients (5 days versus 6.1 days). Among younger patients, the probability of having a repeat hospitalization in 2019 did not significantly differ between undocumented and Medi-Cal patients. Both groups had a probability of repeat hospitalization that was around 22%.

For patients over 65 years of age, encounters from undocumented patients had similarly lower illness severity. Encounters from undocumented patients therefore had 6.5% lower probability for a higher-than-average risk encounter (15.7% vs. 22.2%). There was no significance difference in predicted length of stay. However, the probability of having a repeated hospitalization was higher for undocumented patients compared to Medi-Cal patients. Undocumented patients had a 26.5% probability of having a repeat hospitalization in 2019 while Medi-Cal patients had a 22.0% probability, with a statistically significant difference in probabilities of 4.5%.

Sensitivity Checks. We conducted several sensitivity checks to confirm the robustness of our findings. We also limited the sample to those who identified as Hispanic/Latino, which was 72% of the under 65 sample and 62% of the over 65 sample. For encounter-level outcomes (relative risk of mortality and length of stay), we kept only one encounter per patient. The results were qualitatively similar for all of these checks (see Supplemental Table 2).

For the length of stay outcome, we removed outliers whose inpatient stays were over 21 days. For encounters with patients 18-64 years of age, the difference in predicted length of stay dropped to 0.5 days but remained significantly different from zero. For patients 65 years and older, the difference dropped to 0.1 and remained non-significant.

Discussion

This study compared the severity of inpatient stays between undocumented and full-scope Medi-Cal patients at the largest safety-net hospital in Los Angeles County. Our results provide insight into the health status of undocumented immigrants at the point of needing inpatient medical care, using measures of illness severity, length of hospital stay, and repeat

hospitalizations. In our study, younger undocumented patients who were hospitalized had less severe illness and spent less time in the hospital compared to Medi-Cal patients. While existing work suggests that undocumented immigrants could have higher risk for poorer inpatient outcomes on account of their limited access to medical care,²⁴ the younger undocumented patients in this study do not present with more severe health problems upon hospital admission. Our findings add to others that have found positive health trends among undocumented immigrants compared to documented immigrants or US-born counterparts.^{7,8}

These trends were consistent among older undocumented immigrants as well, but older undocumented patients were more likely to have repeat hospitalizations than their Medi-Cal counterparts. Lower illness severity among older undocumented patients, however, suggests that their higher likelihood of repeat hospitalizations may represent a higher willingness to access care rather than comparatively poorer health. While qualitative work has suggested barriers to receiving regular care can exacerbate older undocumented immigrants' existing chronic conditions,²⁵ we did not find this to be the case from our data.

There are several caveats to our interpretations. First, the Medi-Cal patients at LAC+USC may be a unique, low-income sample. The high proportion of homelessness, for example, indicates this population has complex health care needs. The longer length of stay among Medi-Cal patients may also be attributable to discharge planning issues, such as a long wait for other health facilities or a lack of a discharge destination. Thus, the relatively positive outcomes among undocumented patients may not be due to any inherent health advantages per se, but rather that the comparison group suffers from serious health conditions. Conversely, our sample of undocumented immigrants includes those who have access to county and community facilities via local health plans that provide preventive care. Los Angeles County has actively addressed

the health care needs of the undocumented population, suggesting that this undocumented patient population may be receiving regular care that contributes to their better health at the point of hospitalization.

Limitations

We do not have direct information on the immigration status of patients. However, we believe restricted-scope Medi-Cal is a valid approximation of undocumented status. Patients who are not insured at the time of admission but are Medi-Cal eligible are coded under a separate payment source that provides qualified individuals immediate access to temporary Medi-Cal while applying for permanent Medi-Cal or other health coverage (e.g. Hospital Presumptive Eligibility, HPE). There may also be immigrants who use restricted-scope Medi-Cal who are not undocumented, such as those on student and work visas, and certain permanent legal residents who have not met the five year residency requirement for public insurance. Alternatively, there may be undocumented immigrants who do not qualify for restricted Medi-Cal because of their high incomes. We believe these comprise a very small number in our sample, however.

We also acknowledge that we lack important variables, such as nativity, country of origin, or ethnic subgroups (e.g. Mexican, Salvadoran, Chinese) and do not control for them in our analysis. We do include language use in our IPWRA models, however, which up-weights individuals in the full-scope Medi-Cal comparison who may be foreign-born and prefer Spanish. We also found similar results when we limited the analyses to Hispanic/Latinos, confirming that these trends are consistent for Hispanic/Latino undocumented immigrants. Additionally, we did not have information on baseline health status. While this was indirectly incorporated in our illness severity measures, this is a limitation for length of stay and repeat encounters. Finally, our illness severity outcome might be biased by undiagnosed disease. Yet comprehensive evaluation

upon admission often leads to diagnosis of various chronic conditions, which are then captured in the illness severity score. Nevertheless, we acknowledge the limitations of unknown chronicity of medical conditions and adequacy of treatment in the outpatient setting. Future research, including qualitative interviews, would enrich research with respect to nativity status, length of time in the US, and perceptions around health and health care utilization among undocumented immigrants.

Conclusions and Future Directions

We find that undocumented immigrants in Los Angeles County do not have poorer health outcomes at the point of hospitalization. Contrary to some popular narratives, undocumented immigrants do not appear to overburden the healthcare system. We note, however, that the county provides public or subsidized access to health care services for its undocumented residents. While we do not have information on primary care utilization or outpatient care, future research could examine whether local policies contribute to positive hospitalization characteristics among undocumented immigrants or whether our findings hold in other locales with weaker safety-net programs.

About the authors

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338 **Contributor Statement**

339 AR conceptualized the study, conducted the analysis, and wrote the manuscript. HY
340 conceptualized the study, interpreted results, and assisted with manuscript writing. SD
341 interpreted results and assisted with manuscript writing. CH interpreted results and assisted with
342 manuscript writing. AY conceptualized the study, interpreted results, and assisted with
343 manuscript writing. All authors reviewed the final draft of the manuscript.

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427 Needs and Access to Healthcare. *J Immigr Minor Heal.* Published online 2020.
428 doi:10.1007/s10903-019-00966-7

429 Table 1. Descriptive Table of 2019 Inpatient Encounters in Los Angeles County + USC Medical Center

	18-64 years of age						Over 65 years of age					
	Undocumented (n=6,074)		Medi-Cal (n=12,170)		Total (n=18,244)		Undocumented (n=1,226)		Medi-Cal (n=3,010)		Total (n=4,236)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Mean Age	45.9		41.4		42.9		73.1		73.8		73.6	
Race/Ethnicity												
Hispanic	5576	91.8	7609	62.52	13185	72.27	1061	86.54	1723	57.24	2784	65.72
Non-Hispanic White	6	0.1	508	4.17	514	2.82	11	0.90	88	2.92	99	2.34
Non-Hispanic Black	75	1.23	1893	15.55	1968	10.79	19	1.55	443	14.72	462	10.91
Non-Hispanic Asian	241	3.97	461	3.79	702	3.85	85	6.93	370	12.29	455	10.74
Non-Hispanic Other	176	2.9	1699	13.96	1875	10.28	50	4.08	386	12.82	436	10.29
Gender												
Female	3008	49.52	4964	40.79	7972	43.7	704	57.42	1386	46.05	2090	49.34
Male	3066	50.48	7206	59.21	10272	56.3	522	42.58	1624	53.95	2146	50.66
Language												
English	859	14.14	8229	67.62	9088	49.81	93	7.59	1106	36.74	1199	28.31
Spanish	5007	82.43	3630	29.83	8637	47.34	1040	84.83	1534	50.96	2574	60.76
Other	208	3.42	311	2.56	519	2.84	93	7.59	370	12.29	463	10.93
Homeless	407	6.7	2289	18.81	2696	14.78	59	4.81	401	13.32	460	10.86
Illness Severity (Risk for Mortality)												
Below or Similar	5550	91.37	10804	88.78	16354	89.64	1032	84.18	2314	76.88	3346	78.99
Above	524	8.63	1366	11.22	1890	10.36	194	15.82	696	23.12	890	21.01
Mean Length of Stay (days)	4.5		6.1		5.6		5.2		6.8		6.3	
2019 Repeat Encounter												
First encounter	4286	70.56	8624	70.86	12910	70.76	800	65.25	2166	72.0	2966	70.0
Second or higher	1788	29.44	3546	29.13	5334	29.24	426	34.75	844	28.0	1270	30.0

431 Table 2. Group Differences between Undocumented and Medi-Cal Patients in Inpatient Measures by Age Group, 2019 LAC+USC
 432 Inpatient Admissions

	Illness Severity (Above Average Risk for Mortality)			Length of Stay (Days)			Repeat Patient		
	Pred. Prob	95% CI		Predicted	95% CI		Pred. Prob	95% CI	
18-64 Years of Age									
Undocumented	8.4%	7.3%	9.5%	4.9	4.2	5.6	22.4%	20.0%	24.9%
Medi-Cal	11.6%	11.0%	12.2%	6.1	5.9	6.3	22.4%	21.4%	23.4%
Difference	3.2%	1.9%	4.4%	1.2	0.4	1.9	-0.1%	-2.7%	2.6%
			<i>p<.001</i>			<i>p<.05</i>			<i>NS</i>
65 Years of Age and Older									
Undocumented	15.7%	13.4%	18.1%	6.0	5.0	7.0	26.5%	22.4%	30.6%
Medi-Cal	22.2%	20.7%	23.7%	6.6	6.2	7.0	22.0%	20.2%	23.8%
Difference	6.5%	3.7%	9.3%	0.5	-0.6	1.6	-4.5%	-9.0%	-0.1%
			<i>p<.001</i>			<i>NS</i>			<i>p<.05</i>

433 Predicted probabilities calculated from inverse probability weighted regression adjustment (IPWRA) models. Covariates for “treatment” model (i.e.
 434 undocumented versus Medi-Cal) were age, race, language, gender, homeless status. Covariates for outcome models (ie, illness severity, length of stay, repeat
 435 admission) were age, race, language, gender and homeless status, and length of stay

436 Supplemental Table 1. Descriptive Table of 2019 Unique Patients in Los Angeles County + USC Medical Center

	Undocumented (n=4,286)		Medi-Cal (n=8,624)		Total (n=12,910)		Undocumented (n=800)		Medi-Cal (n=2,166)		Total (n=2,966)	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Mean Age	45.12		40.19		41.86		73.19		74.37		74.05	
Race/Ethnicity												
Hispanic	3950	92.16	5272	61.13	9222	71.43	686	85.75	1215	56.09	1901	64.09
Non-Hispanic White	5	0.12	323	3.75	328	2.54	2	0.25	63	2.91	65	2.19
Non-Hispanic Black	42	0.98	1302	15.1	1344	10.41	15	1.88	289	13.34	304	10.25
Non-Hispanic Asian	145	3.38	328	3.8	473	3.66	55	6.88	282	13.02	337	11.36
Non-Hispanic Other	144	3.36	1399	16.22	1543	11.95	42	5.25	317	14.64	359	12.1
Gender												
Female	2235	52.15	3582	41.54	5817	45.06	440	55	1008	46.54	1448	48.82
Male	2051	47.85	5042	58.46	7093	54.94	360	45	1158	53.46	1518	51.18
Language												
English	661	15.42	6043	70.07	6704	51.93	64	8	790	36.47	854	28.79
Spanish	3504	81.75	2359	27.35	5863	45.41	673	84.12	1082	49.95	1755	59.17
Other	121	2.82	222	2.57	343	2.66	63	7.88	294	13.57	357	12.04
Homeless	253	5.9	1594	18.48	1847	14.31	45	5.62	249	11.5	294	9.91
Illness Severity (Risk for Mortality)												
Below or Similar	3958	92.35	7699	89.27	11657	90.29	685	85.62	1670	77.1	2355	79.4
Above Average	328	7.65	925	10.73	1253	9.71	115	14.37	496	22.9	611	20.6
Mean Length of Stay (days)	4.46		6.07		5.54		5.62		6.82		6.5	

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Supplemental Table 2. Group Differences between Undocumented and Medi-Cal Patients in Inpatient Measures from IPWRA Models for by Age, 2019 LAC+USC Inpatient Admissions

	Illness Severity (Above Average Risk for Mortality)			Length of Stay (Days)			Repeat Patient		
	Pred. Prob	95% CI		Predicted	95% CI		Pred. Prob	95% CI	
Hispanic/Latinos Only									
18-64 Years of Age									
Undocumented	8.07%	7.19%	8.95%	4.33	4.13	4.54	20.36%	18.79%	21.93%
Medi-Cal	11.56%	10.78%	12.33%	5.84	5.60	6.08	23.39%	22.14%	24.64%
Difference	3.48%	2.31%	4.65%	1.50	1.19	1.82	3.03%	1.03%	5.03%
		p<.001			p<.05			p<.05	
65 Years of Age and Older									
Undocumented	16.62%	14.12%	19.12%	4.96	4.26	5.66	30.34%	26.67%	34.01%
Public Insurance	20.02%	18.14%	21.91%	5.97	5.47	6.46	23.21%	20.81%	25.61%
Difference	3.40%	0.29%	6.52%	1.00	0.15	1.86	-7.13%	-11.52%	-2.74%
		p=0.035			p=0.021			p<.001	
No Outliers for Length of Stay									
18-64 Years of Age									
Undocumented				3.62	3.49	3.75			
Medi-Cal				4.12	4.04	4.19			
Difference				0.50	0.36	0.65			
					p<.001				
65 Years of Age and Older									
Undocumented				4.19	3.77	4.62			
Medi-Cal				4.33	4.18	4.47			
Difference				0.13	-0.31	0.58			
					NS				

Predicted probabilities calculated from inverse probability weighted regression adjustment (IPWRA) models. Covariates for “treatment” model (i.e. undocumented versus Medi-Cal) were age, race, language, gender, homeless status. Covariates for outcome models (ie, illness severity, length of stay, repeat admission) were age, race, language, gender and homeless status, and length of stay

	18-64 Years				Over 65 Years			
	OR	[95% CI]		P> z	OR	[95% CI]		P> z
Outcome Model: Among Undocumented								
Age	0.01	0.00	0.03	0.02	0.03	0.00	0.05	0.04
Race								
Latino								
Non-Latino White	-12.76	-13.18	-12.34	0.00	-1.28	-2.98	0.42	0.14
Non-Latino Black	0.39	-0.48	1.26	0.39	-3.34	-5.35	-1.34	0.00
Non-Latino Asian	0.77	0.19	1.35	0.01	-1.69	-3.02	-0.36	0.01
Non-Latino Other	0.18	-0.43	0.80	0.56	-1.08	-2.22	0.07	0.07
Language								
English								
Spanish	-0.06	-0.41	0.28	0.72	-1.07	-1.81	-0.33	0.01
Other	-0.29	-0.88	0.30	0.34	1.16	0.04	2.27	0.04
Repeat Encounter in 2019	0.06	-0.25	0.36	0.72	0.22	-0.15	0.58	0.25
Male	-0.15	-0.42	0.12	0.28	0.16	-0.20	0.51	0.38
Homeless	-0.52	-1.13	0.08	0.09	-0.31	-1.20	0.57	0.49
Intercept	-2.94	-3.53	-2.35	0.00	-2.66	-4.67	-0.66	0.01
Outcome Model: Among Medi-Cal								
Age	0.01	0.01	0.02	0.00	0.04	0.03	0.05	0.00
Race								
Latino								
Non-Latino White	-0.22	-0.54	0.11	0.20	-0.11	-0.68	0.45	0.69
Non-Latino Black	0.01	-0.18	0.20	0.91	-0.17	-0.53	0.19	0.36
Non-Latino Asian	0.22	-0.12	0.56	0.21	0.11	-0.32	0.54	0.63
Non-Latino Other	0.19	0.01	0.37	0.04	0.01	-0.33	0.35	0.95
Language								
English								
Spanish	0.12	-0.03	0.26	0.12	-0.55	-0.85	-0.25	0.00
Other	0.07	-0.32	0.46	0.73	-0.28	-0.64	0.08	0.12
Repeat Encounter in 2019	0.21	0.08	0.34	0.00	0.19	-0.01	0.39	0.06
Male	-0.20	-0.32	-0.07	0.00	0.25	0.06	0.43	0.01
Homeless	-0.07	-0.24	0.10	0.43	-0.32	-0.63	-0.02	0.04
Intercept	-2.54	-2.74	-2.35	0.00	-4.06	-4.95	-3.17	0.00
"Treatment" Model: Medi-Cal (1) versus Undocumented (0)								

Age	-0.01	-0.01	-0.01	0.00	0.02	0.01	0.03	0.00
Race								
Latino								
Non-Latino White	2.57	1.75	3.38	0.00	0.33	-0.31	0.98	0.31
Non-Latino Black	1.41	1.17	1.66	0.00	1.33	0.79	1.87	0.00
Non-Latino Asian	-0.32	-0.60	-0.05	0.02	0.23	-0.36	0.82	0.44
Non-Latino Other	0.76	0.59	0.94	0.00	0.52	0.13	0.92	0.01
Language								
English								
Spanish	-2.11	-2.21	-2.01	0.00	-1.49	-1.81	-1.16	0.00
Other	-1.30	-1.59	-1.01	0.00	-0.88	-1.40	-0.35	0.00
Male	0.27	0.19	0.34	0.00	0.20	0.06	0.35	0.01
Homeless	0.26	0.13	0.39	0.00	0.21	-0.11	0.53	0.19
Intercept	2.02	1.89	2.15	0.00	0.36	-0.38	1.11	0.34

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[illegible]

Age	-0.01	-0.01	-0.01	0.00	0.02	0.01	0.03	0.00
Race								
Latino								
Non-Latino White	2.57	1.75	3.38	0.00	0.33	-0.31	0.98	0.31
Non-Latino Black	1.41	1.17	1.66	0.00	1.33	0.79	1.87	0.00
Non-Latino Asian	-0.32	-0.60	-0.05	0.02	0.23	-0.36	0.82	0.44
Non-Latino Other	0.76	0.59	0.94	0.00	0.52	0.13	0.92	0.01
Language								
English								
Spanish	-2.11	-2.21	-2.01	0.00	-1.49	-1.81	-1.16	0.00
Other	-1.30	-1.59	-1.01	0.00	-0.88	-1.40	-0.35	0.00
Male	0.27	0.19	0.34	0.00	0.20	0.06	0.35	0.01
Homeless	0.26	0.13	0.39	0.00	0.21	-0.11	0.53	0.19
Intercept	2.02	1.89	2.15	0.00	0.36	-0.38	1.11	0.34

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Age	-0.01	-0.02	-0.01	0.00	0.03	0.01	0.04	0.00
Race								
Latino								
Non-Latino White	2.38	1.48	3.27	0.00	1.67	0.23	3.11	0.02
Non-Latino Black	1.68	1.36	2.01	0.00	1.18	0.57	1.80	0.00
Non-Latino Asian	-0.17	-0.51	0.16	0.31	0.32	-0.36	1.00	0.35
Non-Latino Other	0.83	0.64	1.02	0.00	0.49	0.05	0.93	0.03
Language								
English								
Spanish	-2.08	-2.19	-1.97	0.00	-1.51	-1.89	-1.13	0.00
Other	-1.08	-1.45	-0.72	0.00	-0.94	-1.54	-0.34	0.00
Male	0.36	0.27	0.45	0.00	0.12	-0.05	0.30	0.17
Homeless	0.41	0.25	0.57	0.00	-0.06	-0.44	0.32	0.75
Intercept	2.01	1.87	2.16	0.00	0.04	-0.87	0.95	0.93

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