Title

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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9

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.

26

Introduction

There is growing interest in how immigration status affects the health care access and utilization of 10.5 million undocumented immigrants[1] 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 Hook[8] 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

49   and may capture their health care utilization when individuals are relatively healthy.

50   Undocumented immigrants tend to be younger than their documented counterparts,[8] suggesting

51   that some chronic health conditions may not have yet emerged or have not reached the point of

52   requiring serious medical intervention. Undocumented immigrants are also more likely to be

53   positively selected on health, given the costs and risks inherent in unauthorized migration.[9]

54   Undocumented immigrants' younger age and positive health selection may buoy their general

55   health status, and as a result, they may not seek regular medical care.

56   What is unknown, however, is the health status of undocumented immigrants when they

57   reach the point of needing intensive medical care and their health needs when they are in close

58   contact with the health care system. As immigrants stay longer in the United States, their positive

59   health advantage erodes.[10] In the case of undocumented immigrants, initial health advantages can

60   obscure longer-term care needs as their health deteriorates over time. In the general population,

61   those who are uninsured or do not have regular medical care are more likely to enter the health

62   care system in poorer health and have worse outcomes for both overall health and specific

63   diseases.[11] Given their overall lack of medical care access, it is possible that undocumented

64   immigrants will display poorer health outcomes than other groups when they are at the point of

65   needing higher level care. Moreover, consistent underutilization of preventive services may leave

66   them with more advanced stages of disease when they eventually need medical attention.

67   The extant literature has provided only limited or dated information on this topic. One

68   study found uninsured undocumented immigrants hospitalized in Florida to have higher Case-

69   Mix index (a measure of disease severity) but shorter hospital stays than immigrants with legal

70   status.[12] Among patients in select cites in California and Texas, undocumented immigrants had

71   the same levels of hospitalizations as documented immigrants, with the exception of childbirth.[13]

72 Treatment of End Stage Renal Disease (ESRD) among undocumented immigrants has been

73 widely studied as an example of a life-threatening condition that requires intensive medical

74 treatment but is highly mediated by access to health care. Undocumented immigrants with ESRD

75 are more likely to receive emergency-only hemodialysis than standard hemodialysis,[14] which is

76 associated with increased mortality, health care utilization, and costs.[15,16]

77 In this study, we explore the severity of hospitalizations among undocumented

78 immigrants of all races/ethnicities who have required inpatient stays at the largest-safety net

79 hospital in Los Angeles County. LA County has the largest population of undocumented

80 immigrants country; there are nearly 880,000 undocumented immigrants, representing a wide

81 number of countries of origin.[17] We use insurance status to approximate immigration status,

82 leveraging the county's unique health plans for undocumented immigrants to accurately estimate

83 the likely undocumented population. Addressing this knowledge gap will reveal potential unmet

84 needs of undocumented immigrants in the hospital setting during critical periods of illness, as

85 well as possible disparities in inpatient health care.

86 **Methods**

87 <u>Sample</u>

88 The study was a retrospective analysis of all inpatient stays at Los Angeles County +

89 University of Southern California (LAC+USC) Medical Center from January 1, 2019 to

90 December 31, 2019. We merged two data sources: the LAC+USC internal electronic medical

91 records system using Cerner PowerInsight and Vizient Health System Data, a hospital billing and

92 administrative claims database. All data were de-identified to conform to Health Insurance

93 Portability and Accountability Act (HIPAA) requirements. This study was deemed exempt by

94 the USC Institutional Review Board.

95   We examined the data at both the encounter and patient level. For encounter data, there

96   were 29,765 total inpatient hospitalizations at LAC+USC in 2019. We limited the sample to

97   hospitalizations with patients 18 years of age and older and who were full-scope Medi-Cal

98   patients (California's Medicaid program) or undocumented (coding detailed below). Our final

99   analytic sample consisted of 22,480 inpatient encounters. In our analyses, we separated the

100   sample by age (18-64 years and 65 years and older) because of differences in health status at

101   older ages and public insurance coverage (18-64 years=18,244; 65 years and older=4,236). For

102   the older adults, we limited the sample to those who only had Medi-Cal or a combination of

103   Medi-Cal and Medicare to better isolate a low-income comparison group. For outcomes that used

104   patient-level data (e.g. unique number of patients who were admitted to LAC+USC in 2019),

105   there were 15,876 patients (18-64 years=12,910; 65 years and older=2,966).

106   Variables

107   *Outcomes*. We examined three outcomes indicating the severity of the hospitalization:

108   illness severity, length of hospital stay, and repeat hospitalization.

109   Illness severity was measured by the relative risk of mortality, which was calculated by a

110   proprietary algorithm that predicts the risk for mortality based on patient demographics, clinical

111   characteristics, procedures, and co-morbidities for each Medicare Severity-Diagnosis Related

112   Group (MS-DRG). For example, the risk prediction for a liver transplant (MS-DRG 5 or 6) was a

113   function of hemodialysis, cachexia, complication of transplanted organ/tissue, ventilator on

114   admission day, and Type II Diabetes. The risk for mortality was averaged over all encounters in

115   the hospital for each diagnosis group in 2019. Encounters that were 75% of the mean were coded

116   "lower risk" relative to the mean. Encounters that were within 75% and 125% of the mean were

117   coded "similar risk" and encounters more than 125% of the mean were considered "higher risk".

118   We dichotomized the outcome to hospitalizations lower or similar to the mean versus those with

119   higher risk of mortality.

120   Length of hospital stay was the total number of days of the inpatient admission, with

121   longer encounters indicating sicker patients. This was an encounter-level variable, meaning that

122   each hospitalization had its own length of stay. To account for outliers, we conducted additional

123   analyses with encounters longer than 21 days removed.

124   Repeat hospitalization was a patient-level variable and was dichotomized to patients who

125   had one inpatient admission in 2019 versus those who had more than one admission. We

126   assumed those with more than one admission were sicker and needed more comprehensive care.

127   Though it is possible that repeated hospitalizations might be due to unrelated/isolated events (e.g.

128   injuries), it is more likely that repeated hospitalizations result from unresolved/ongoing illness.

129   *Immigration Status*. We compared undocumented immigrants to full-scope Medi-Cal

130   patients using insurance status as a proxy to determine immigration status. We coded a patient as

131   having undocumented status if the primary insurance for the encounter was restricted-scope

132   Medi-Cal, which provides health services to low-income Los Angeles County residents who

133   meet the income threshold for Medi-Cal but do not meet immigration status requirements as

134   either US nationals, citizens, or lawful permanent residents. These services include access to

135   county facilities that provide preventive, emergency, diagnostic, specialty, inpatient, and

136   pharmacy services, as well as a local health care program (My Health LA), that offers primary

137   and preventive health care services through community clinic partners.[18]

138   Given the income requirement for restricted-scope Medi-Cal eligibility, we chose full-

139   scope Medi-Cal (hereafter referred to as Medi-Cal) patients as a comparison group of low-

140   income patients who are either US-born or foreign-born with authorized status. Because of the

141 citizenship requirements for federal health insurance, nearly all of the Medi-Cal patients are

142 either US-born or documented. The other option for a comparison group is individuals on other

143 forms of insurance (e.g. private insurance), but we do not know either the poverty level or the

144 immigration status of these patients.

145   *Covariates.* We included age as a continuous variable, race/ethnicity (Hispanic (ref.),

146 non-Hispanic White, non-Hispanic Black, non-Hispanic Asian, non-Hispanic other), language

147 (English (ref.), Spanish, other), gender (male (ref.), female), homeless status (housed (ref.), non-

148 housed). We include language preference to account for reduced English proficiency that can

149 impact treatment utilization and quality.[19] As the primary safety net hospital in the county,

150 LAC+USC has a substantial homeless patient population. We include homeless status to account

151 for the substantial barriers to regular medical care that unhoused individuals face, as well as their

152 complex health conditions.[20] For encounter-level outcomes, we included an indicator of whether

153 the encounter was the only admission for the patient in 2019 (ref.) or if it was a repeat

154 hospitalization. For instance, if an encounter was one of two or more hospitalizations from a

155 patient in 2019, all encounters from that patient were coded "1". If an encounter was the only

156 hospitalization from a patient in 2019, it was coded "0".

157 <u>Analysis</u>

158   Because of the inherent compositional differences between undocumented and Medi-Cal

159 patients, we estimated group differences in our outcomes of interest using inverse probability

160 weighted regression adjustment (IPWRA). This approach weights observations based on the

161 inverse of their conditional probability of "treatment" exposure (i.e., being undocumented). The

162 "treatment" model is estimated first, and the predicted probability of being "treated" (ie,

163   undocumented) is used to compute the inverse-probability weights. These weights are then

164   applied to the outcome models (ie, illness severity, length of stay, repeat admission), creating a

165   pseudo-matched sample, such that undocumented and Medi-Cal patients are balanced in their

166   covariates. In conventional multivariate regression analysis, covariates are included in the model

167   to account for compositional differences but each observation is weighted equally. In IPWRA

168   models, observations that have a higher likelihood of being "treated" (ie, undocumented) are up-

169   weighted while those that have lower likelihood are down-weighted. IPWRA is also known as

170   the doubly-robust method because it models both the outcome and propensity for "treatment"

171   within the same framework and only one needs to be correctly specified in order to produce

172   unbiased results.[21]

173   Each weighted outcome model is run on the undocumented group first and then the

174   comparison group. We calculated average treatment effects (ATE), a common post-estimation

175   approach for treatment effects models such as the IPWRA,[22] for each of our outcomes. The ATE

176   take a counterfactual approach and assume that each subject has a pair of potential outcomes: the

177   outcome if they were undocumented or the outcome if they were on Medi-Cal. The predicted

178   means (POM) for the outcome is calculated for each observation assuming they are

179   undocumented (using their own covariate values) and then again for each observation assuming

180   they are on Medi-Cal. For each observation, the difference between the undocumented POM and

181   Medi-Cal POM is called the effect of "treatment". This difference is averaged across the entire

182   population to calculate the ATE.

183   For the "treatment" model (i.e., undocumented versus Medi-Cal), we included age, race,

184   language, gender and homeless status as predictors of undocumented status. For the outcome

185   models (i.e., illness severity, length of stay, repeat admission), we included the same covariates

186 as the "treatment" model as well as whether the encounter was a repeat hospitalization for the

187 illness severity and length of stay outcomes. For illness severity and repeat admissions, we

188 conducted logistic regressions, whereas for length of stay, we conducted a linear regression

189 model. We calculated robust standard errors to correct for potential for heteroskedasticity. We

190 did this separately for patients 18-64 versus 65 years and older. We conducted our analyses using

191 Stata v16.[23] We provide the coefficients for the IPWRA models in the supplemental material.

192 **Results**

193 <u>Descriptives</u>

194   Table 1 provides descriptive information for our sample at the encounter level. The same

195 descriptive statistics at the patient level are provided in Supplemental Table 1. Nearly one-third

196 of encounters were from undocumented patients (31.6%). The mean age for younger

197 undocumented patients (18-64) was 45.8 for undocumented patients and 41.6 for Medi-Cal

198 patients. Among older patients (65+ years), the mean age was 73.1 for undocumented and 73.8

199 for Medi-Cal. Undocumented patients in both age groups were predominantly Hispanic (18-64

200 years: 91.8% vs. 65+ years: 86.5%). Medi-Cal patients in both age groups were also

201 predominantly Hispanic, but comprised a lower proportion (18-64 years: 62.5% vs. 65+ years:

202 57.2%).

203   Undocumented patients primarily spoke Spanish (18-64 years: 82.5%; 65+ years: 84.8%),

204 whereas Medi-Cal patients had differences in language preference according to age group.

205 Notably, homelessness was nearly three-fold greater among Medi-Cal patients compared to

206 undocumented patients across age groups (18-64 years: 18.8% vs. 6.6%; 65+ years: 13.3% vs.

207 4.8%).

208   Compared to Medi-Cal patients, undocumented patients had lower illness severity and

209   average length of stay. Among younger patients, 8.6% of undocumented patients had higher than

210   average relative mortality risks compared to 11.2% of Medi-Cal patients. Among older patients,

211   15.8% of undocumented patients had higher than average mortality risk compared to 23.1% of

212   Medi-Cal patients. The average length of stay in the hospital was 4.6 days for undocumented and

213   6.1 days for Medi-Cal among younger patients and 5.2 days and 6.8 days, respectively, among

214   older patients. Among younger patients, inpatient encounters over the study period were

215   comparable between undocumented and Medi-Cal patients, in which approximately 70.7% were

216   first encounters and 29.1% were repeat hospitalizations. However, among older patients,

217   undocumented patients had more repeat hospitalizations compared to Medi-Cal patients (34.8%

218   vs. 24.8%).

219   <u>Group Differences in Inpatient Measures</u>

220   The results of the IPWRA are presented in Table 2. For patients 18-64 years of age,

221   encounters with undocumented patients had lower illness severity and shorter lengths of stay

222   than encounters with Medi-Cal patients. The probability of having an encounter with a higher-

223   than-average risk for mortality was 8.4% for undocumented patients and 11.6% for Medi-Cal

224   patients. Encounters from undocumented patients therefore had 3.2% lower probability of a

225   higher-than-average mortality risk compared to encounters from Med-Cal patients. The average

226   length of stay for encounters from undocumented patients was 1.1 days shorter than for Medi-

227   Cal patients (5 days versus 6.1 days). Among younger patients, the probability of having a repeat

228   hospitalization in 2019 did not significantly differ between undocumented and Medi-Cal patients.

229   Both groups had a probability of repeat hospitalization that was around 22%.

230   For patients over 65 years of age, encounters from undocumented patients had similarly

231   lower illness severity. Encounters from undocumented patients therefore had 6.5% lower

232   probability for a higher-than-average risk encounter (15.7% vs. 22.2%). There was no

233   significance difference in predicted length of stay. However, the probability of having a repeated

234   hospitalization was higher for undocumented patients compared to Medi-Cal patients.

235   Undocumented patients had a 26.5% probability of having a repeat hospitalization in 2019 while

236   Medi-Cal patients had a 22.0% probability, with a statistically significant difference in

237   probabilities of 4.5%.

238   *Sensitivity Checks.* We conducted several sensitivity checks to confirm the robustness of

239   our findings. We also limited the sample to those who identified as Hispanic/Latino, which was

240   72% of the under 65 sample and 62% of the over 65 sample. For encounter-level outcomes

241   (relative risk of mortality and length of stay), we kept only one encounter per patient. The results

242   were qualitatively similar for all of these checks (see Supplemental Table 2).

243   For the length of stay outcome, we removed outliers whose inpatient stays were over 21

244   days. For encounters with patients 18-64 years of age, the difference in predicted length of stay

245   dropped to 0.5 days but remained significantly different from zero. For patients 65 years and

246   older, the difference dropped to 0.1 and remained non-significant.

247   **Discussion**

248   This study compared the severity of inpatient stays between undocumented and full-

249   scope Medi-Cal patients at the largest safety-net hospital in Los Angeles County. Our results

250   provide insight into the health status of undocumented immigrants at the point of needing

251   inpatient medical care, using measures of illness severity, length of hospital stay, and repeat

252 hospitalizations. In our study, younger undocumented patients who were hospitalized had less

253 severe illness and spent less time in the hospital compared to Medi-Cal patients. While existing

254 work suggests that undocumented immigrants could have higher risk for poorer inpatient

255 outcomes on account of their limited access to medical care,[24] the younger undocumented

256 patients in this study do not present with more severe health problems upon hospital admission.

257 Our findings add to others that have found positive health trends among undocumented

258 immigrants compared to documented immigrants or US-born counterparts.[7,8]

259   These trends were consistent among older undocumented immigrants as well, but older

260 undocumented patients were more likely to have repeat hospitalizations than their Medi-Cal

261 counterparts. Lower illness severity among older undocumented patients, however, suggests that

262 their higher likelihood of repeat hospitalizations may represent a higher willingness to access

263 care rather than comparatively poorer health. While qualitative work has suggested barriers to

264 receiving regular care can exacerbate older undocumented immigrants' existing chronic

265 conditions,[25] we did not find this to be the case from our data.

266   There are several caveats to our interpretations. First, the Medi-Cal patients at LAC+USC

267 may be a unique, low-income sample. The high proportion of homelessness, for example,

268 indicates this population has complex health care needs. The longer length of stay among Medi-

269 Cal patients may also be attributable to discharge planning issues, such as a long wait for other

270 health facilities or a lack of a discharge destination. Thus, the relatively positive outcomes

271 among undocumented patients may not be due to any inherent health advantages per se, but

272 rather that the comparison group suffers from serious health conditions. Conversely, our sample

273 of undocumented immigrants includes those who have access to county and community facilities

274 via local health plans that provide preventive care. Los Angeles County has actively addressed

275   the health care needs of the undocumented population, suggesting that this undocumented patient

276   population may be receiving regular care that contributes to their better health at the point of

277   hospitalization.

278   *Limitations*

279   We do not have direct information on the immigration status of patients. However, we

280   believe restricted-scope Medi-Cal is a valid approximation of undocumented status. Patients who

281   are not insured at the time of admission but are Medi-Cal eligible are coded under a separate

282   payment source that provides qualified individuals immediate access to temporary Medi-Cal

283   while applying for permanent Medi-Cal or other health coverage (e.g. Hospital Presumptive

284   Eligibility, HPE). There may also be immigrants who use restricted-scope Medi-Cal who are not

285   undocumented, such as those on student and work visas, and certain permanent legal residents

286   who have not met the five year residency requirement for public insurance. Alternatively, there

287   may be undocumented immigrants who do not qualify for restricted Medi-Cal because of their

288   high incomes. We believe these comprise a very small number in our sample, however.

289   We also acknowledge that we lack important variables, such as nativity, country of

290   origin, or ethnic subgroups (e.g. Mexican, Salvadoran, Chinese) and do not control for them in

291   our analysis. We do include language use in our IPWRA models, however, which up-weights

292   individuals in the full-scope Medi-Cal comparison who may be foreign-born and prefer Spanish.

293   We also found similar results when we limited the analyses to Hispanic/Latinos, confirming that

294   these trends are consistent for Hispanic/Latino undocumented immigrants. Additionally, we did

295   not have information on baseline health status. While this was indirectly incorporated in our

296   illness severity measures, this is a limitation for length of stay and repeat encounters. Finally, our

297   illness severity outcome might be biased by undiagnosed disease. Yet comprehensive evaluation

13

298 upon admission often leads to diagnosis of various chronic conditions, which are then captured

299 in the illness severity score. Nevertheless, we acknowledge the limitations of unknown

300 chronicity of medical conditions and adequacy of treatment in the outpatient setting. Future

301 research, including qualitative interviews, would enrich research with respect to nativity status,

302 length of time in the US, and perceptions around health and health care utilization among

303 undocumented immigrants.

304 *Conclusions and Future Directions*

305   We find that undocumented immigrants in Los Angeles County do not have poorer health

306 outcomes at the point of hospitalization. Contrary to some popular narratives, undocumented

307 immigrants do not appear to overburden the healthcare system. We note, however, that the

308 county provides public or subsidized access to health care services for its undocumented

309 residents. While we do not have information on primary care utilization or outpatient care, future

310 research could examine whether local policies contribute to positive hospitalization

311 characteristics among undocumented immigrants or whether our findings hold in other locales

312 with weaker safety-net programs.

313
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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.
344

348 **Human Participant Protection**
349 All project activities were reviewed and approved by the USC Institutional Review Board (HS-
350 19-00890), which served as a reliance for the UC Irvine Institutional Review Board. The project
351 did not require informed consent.
352
353

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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	0 426	34.75	844	28.0	1270	30.0

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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%
			p<.001			*p<.05*			*NS*
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%
			p<.001			*NS*			*p<.05*

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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441 Supplemental Table 2. Group Differences between Undocumented and Medi-Cal Patients in Inpatient Measures from IPWRA Models
442 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				

443 Predicted probabilities calculated from inverse probability weighted regression adjustment (IPWRA) models. Covariates for "treatment" model (i.e.
444 undocumented versus Medi-Cal) were age, race, language, gender, homeless status. Covariates for outcome models (ie, illness severity, length of stay, repeat
445 admission) were age, race, language, gender and homeless status, and length of stay
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Supplemental Table 3. IPWRA Regression Models for Illness Severity, by Age

	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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Supplemental Table 4. IPWRA Regression Models for Length of Stay, by Age

	18-64 Years			Over 65 Years		
	B	**[95% CI]**	**P>|z|**	**B**	**[95% CI]**	**P>|z|**
Outcome Model: Among Undocumented						
Age	0.03	-0.04 0.09	0.44	0.00	-0.13 0.14	0.95
Race						
Latino						
Non-Latino White	-4.11	-7.06 -1.16	0.01	-2.58	-10.74 5.57	0.54
Non-Latino Black	4.02	-1.23 9.27	0.13	1.06	-6.57 8.69	0.79
Non-Latino Asian	0.77	-1.06 2.59	0.41	2.00	-5.83 9.83	0.62
Non-Latino Other	0.86	-0.90 2.62	0.34	6.83	-3.34 17.00	0.19
Language						
English						
Spanish	0.86	-0.07 1.79	0.07	1.83	-5.48 9.13	0.62
Other	1.00	-1.25 3.25	0.38	2.68	-1.10 6.46	0.17
Repeat Encounter in 2019	-1.41	-2.99 0.16	0.08	-0.65	-1.95 0.65	0.33
Male	0.34	-0.88 1.55	0.59	0.21	-1.55 1.97	0.81
Homeless	5.10	0.76 9.44	0.02	8.62	1.34 15.91	0.02
Intercept	2.39	-0.16 4.95	0.07	2.44	-11.49 16.37	0.73
Outcome Model: Among Medi-Cal						
Age	0.04	0.03 0.05	0.00	0.05	0.00 0.10	0.03
Race						
Latino						
Non-Latino White	-0.46	-1.44 0.52	0.36	2.65	-1.35 6.65	0.20
Non-Latino Black	-0.47	-1.09 0.15	0.14	-0.55	-2.47 1.36	0.57
Non-Latino Asian	1.23	0.01 2.45	0.05	2.05	0.03 4.06	0.05
Non-Latino Other	1.03	0.29 1.78	0.01	2.58	0.50 4.66	0.02
Language						
English						
Spanish	0.70	0.23 1.17	0.00	0.51	-1.14 2.15	0.55
Other	0.75	-0.89 2.38	0.37	-0.93	-2.34 0.48	0.20
Repeat Encounter in 2019	-0.01	-0.44 0.43	0.97	-0.07	-1.04 0.89	0.88
Male	0.54	0.14 0.93	0.01	0.67	-0.21 1.56	0.14
Homeless	3.95	3.10 4.80	0.00	6.19	3.77 8.61	0.00
Intercept	3.10	2.66 3.53	0.00	0.95	-3.00 4.90	0.64
"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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Supplemental Table 5. IPWRA Regression Models for Repeat Patient Encounter, by Age

	18-64 Years			Over 65 Years		
	OR	[95% CI]	P>|z|	OR	[95% CI]	P>|z|
Outcome Model: Among Undocumented						
Age	0.02	0.00 0.03	0.01	0.00	-0.03 0.04	0.78
Race						
Latino						
Non-Latino White	-0.09	-2.06 1.89	0.93	0.16	-2.54 2.86	0.91
Non-Latino Black	1.07	0.32 1.81	0.01	-0.40	-2.05 1.26	0.64
Non-Latino Asian	0.13	-0.48 0.73	0.68	-0.58	-1.81 0.65	0.36
Non-Latino Other	-0.68	-1.35 -0.02	0.04	-1.39	-2.85 0.06	0.06
Language						
English						
Spanish	0.19	-0.10 0.48	0.21	-0.22	-1.09 0.64	0.61
Other	0.53	-0.15 1.22	0.12	-0.06	-1.06 0.94	0.90
Repeat Encounter in 2019	0.00			0.00		
Male	0.21	-0.05 0.48	0.12	-0.13	-0.52 0.26	0.51
Homeless	0.65	0.12 1.18	0.02	-0.42	-1.41 0.58	0.41
Intercept	-2.48	-3.08 -1.89	0.00	-0.90	-3.55 1.75	0.51
Outcome Model: Among Medi-Cal						
Age	0.01	0.01 0.02	0.00	-0.02	-0.04 -0.01	0.01
Race						
Latino						
Non-Latino White	0.19	-0.08 0.46	0.16	-0.04	-0.73 0.66	0.92
Non-Latino Black	0.08	-0.09 0.24	0.36	0.21	-0.22 0.64	0.35
Non-Latino Asian	0.08	-0.28 0.44	0.67	0.36	-0.15 0.87	0.17
Non-Latino Other	-0.57	-0.75 -0.39	0.00	-0.38	-0.83 0.06	0.09
Language						
English						
Spanish	0.24	0.11 0.38	0.00	0.22	-0.15 0.59	0.24
Other	0.08	-0.34 0.51	0.70	-0.36	-0.79 0.07	0.10
Repeat Encounter in 2019	0.00			0.00		
Male	0.06	-0.06 0.18	0.31	0.01	-0.21 0.23	0.94
Homeless	0.15	0.00 0.29	0.05	0.38	0.05 0.72	0.03
Intercept	-2.02	-2.18 -1.86	0.00	0.13	-1.02 1.29	0.82
"Treatment" Model: Medi-Cal (1) versus Undocumented (0)						

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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