Limited English Proficiency and Uninsurance Among U.S. Adults: The Moderating Role of Disability Status

Abstract

The present study explores whether limited English proficiency (LEP) is associated with higher odds of being uninsured among U.S. adults and whether disability status moderates this association after adjusting for socioeconomic and demographic factors. Using a random subset of 160,000 person-level records from the 2023 American Community Survey 1-year Public Use Microdata Sample, logistic regression results show that individuals with LEP have higher odds of being uninsured compared with English-proficient adults. Disability status is associated with lower odds of being uninsured, but the LEP-by-disability interaction is not statistically significant. These findings support the independent importance of LEP, but do not support that LEP and disability compound one another in predicting uninsured status.

Introduction

Individuals with limited English proficiency (LEP) often face linguistic barriers that limit their ability to access and understand medical information, are more likely to work in lower-wage jobs that do not offer employer-sponsored insurance, and may encounter structural barriers in the healthcare system (Haldar et al., 2023; Lu & Myerson, 2020).

Full coverage health insurance is especially important for disabled people, who access healthcare services at a much higher rate than non-disabled people and are more likely to experience affordability and access barriers (Kennedy et al., 2017). However, disabled adults may also have greater access to public insurance programs such as Medicaid or Medicare. While there is abundant research examining insurance disparities related to LEP and disability separately, it is less clear how these conditions operate in conjunction with each other. This study asks whether LEP is associated with higher odds of being uninsured and whether disability status moderates that association.

Data and Methods

We use person-level microdata from the 2023 American Community Survey (ACS) 1-year Public Use Microdata Sample (PUMS). The ACS is a nationally representative survey conducted by the U.S. Census Bureau that provides demographic, socioeconomic, disability, language, and health insurance information. For computational feasibility, we analyze a random subset of 160,000 adult respondents drawn from the full 2023 ACS person records.

The analytic sample was restricted to respondents aged 26 and older with valid data on all model variables. Respondents younger than 26 were excluded because they may remain covered under a parent's health insurance plan, which complicates the interpretation of the outcome variable. English-only speakers were also excluded because the ACS does not administer the English-speaking ability variable (ENG) to respondents who speak only English. After applying these restrictions, the final analytic sample comprised 21,113 respondents.

The outcome variable is uninsured status, recoded from the ACS health insurance coverage variable, where 1 = uninsured and 0 = insured. Respondents who reported speaking English "very well" or "well" were classified as English proficient (EP), and those reporting "not well" or "not at all" were classified as LEP. Disability status was coded as 0 = no disability and 1 = disabled.

To examine the relationships among English proficiency, disability status, and health insurance coverage, this study used logistic regression analysis because the outcome variable is dichotomous.

Based on the literature, age, sex, race, Hispanic ethnicity, educational attainment, employment status, and citizenship status were candidate covariates. A series of nested logistic regression models was compared by sequentially adding candidate covariates. Model fit was

assessed using Akaike Information Criterion (AIC) values and likelihood ratio tests (Table A1-A3). In these comparisons, including all candidate covariates improved model fit, so all covariates were retained in the final analytic models.

Intercorrelations for all variables included are presented in Table A4. None of the variable correlations is more extreme than the threshold value of R = 0.70, which suggests that no variables will have to be combined or removed from the planned analysis.

Three nested models were estimated: Model 1 included LEP and covariates; Model 2 added disability status; and Model 3 added the LEP-by-disability interaction. The final model was:

$$\begin{aligned}\text{logit}(P(Y_i = 1)) = \beta_0 &+ \beta_1 LEP_i + \beta_2 DIS_i + \beta_3 (LEP_i \times DIS_i) \\ &+ \beta_4 AGEP_i + \beta_5 SEX_i + \beta_6 Race_i \\ &+ \beta_7 Hispanic\_ethnicity_i + \beta_8 Education_i \\ &+ \beta_9 Employment\_status_i + \beta_{10} OCIT_i\end{aligned}$$

Across the three models, adjusted variance inflation factor (VIF) values were well below the conventional threshold for problematic multicollinearity, indicating that multicollinearity was not a meaningful concern.

Results

After applying person-level survey weights, the sample represents approximately 2.40 million adults in the target population. Overall, 14.4% of respondents are uninsured; 24.2% are classified as having LEP; and 13.1% report having a disability.

Descriptive results show clear differences in uninsured rates across key subgroups. Respondents with LEP have a much higher uninsured rate than EP respondents, 29.9% compared with 13.1% (Figure A1). By contrast, respondents with disabilities show a lower uninsured rate than respondents without disabilities, 9.0% compared with 18.4% (Figure A2), which differs from the study's initial expectation.

The joint pattern between English proficiency and disability status shows that LEP is associated with higher uninsurance across both disability groups. Among respondents without disabilities, those with LEP have a much higher uninsured rate than those who are EP, 33.7% compared with 13.9% (Figure A3). Among respondents with disabilities, those with LEP also have a higher uninsured rate than those who are EP, 12.8% compared with 7.2% (Figure A3), although the gap is smaller.

English proficiency is statistically significantly associated with uninsured status. In Model 1, the odds ratio for LEP is 1.526, meaning that individuals with LEP have 52.6% higher odds of being uninsured compared to those who are EP, holding all other variables constant (Table A5). After disability status is added in Model 2, the LEP estimate remains similar, suggesting that the LEP-uninsurance association is not explained by disability status.

Disability status is statistically significantly associated with uninsured status, but in the opposite direction from the initial expectation. In Model 2, respondents with disabilities have lower odds of being uninsured compared with respondents without disabilities (OR = 0.574, 95% CI: 0.493, 0.667), holding all other variables constant (Table A6). This may reflect greater access to public insurance programs among disabled adults.

Model 3 tests whether disability status moderates the relationship between English proficiency and insurance coverage. The interaction term between English proficiency and disability status is not statistically significant (OR = 0.922, 95% CI: 0.685, 1.240), holding all other variables constant (Table A7). Because the confidence interval includes 1, there is not sufficient statistical evidence that the association between English proficiency and uninsured status differs significantly by disability status.

Other research using ACS data has employed a broader definition, classifying anyone speaking English less than “very well” as LEP (Haldar et al., 2023). A sensitivity analysis was conducted by re-running all three models under this broader definition and comparing results with the primary specification. Across both definitions of LEP, results for the main and interactive effects were nearly identical in both magnitude and significance.

The sensitivity analysis for age cutoff suggested that the interaction between English proficiency and disability status appeared to be sensitive to age specification. When participants aged 16 and older were included, the interaction term became statistically significant, but it was not statistically significant in the primary analysis, which restricted the analytic sample to participants aged 26 and older. This indicated that the interaction may not be completely absent and may be more pronounced among younger individuals.

Discussion

The results suggest that LEP is consistently associated with higher odds of being uninsured among U.S. adults aged 26 and older. This relationship remains statistically significant after adjusting for disability status and covariates. This finding supports the expectation that language barriers are closely related to health insurance disparities.

At the same time, disability status is associated with lower odds of being uninsured. Although this differs from the study’s initial expectation, it is reasonable given that disabled adults may have greater access to public insurance programs. However, this finding should not be interpreted to mean that disabled adults face fewer healthcare barriers. Insurance coverage is only one dimension of healthcare access, and disabled adults may still face affordability barriers, inaccessible healthcare settings, limited provider knowledge, and difficulty receiving appropriate accommodations.

The interaction model does not provide evidence that disability status moderates the relationship between English proficiency and insurance coverage. Therefore, the evidence supports the independent importance of LEP, but does not support that LEP and disability compound one another in predicting uninsured status.

Several limitations should be considered. First, this study uses a cross-sectional observational dataset, so the results show associations rather than causal effects. Second, both English proficiency and disability status are measured as binary variables, which may hide meaningful variation within each group. Third, English-only speakers were excluded because the ACS does not administer the ENG question to them, which means the analytic sample is more focused on multilingual adults rather than all U.S. adults. Finally, it would also be useful to distinguish among different forms of health insurance coverage, such as Medicaid, Medicare, employer-sponsored insurance, direct purchase insurance, etc.

Generative AI Use Statement

No generative AI tools were used in the analysis, writing, or preparation of this submission.

References

Haldar, S., Pillai, D., & Artiga, S. (2023). *Overview of health coverage and care for individuals with limited English proficiency (LEP)*. Kaiser Family Foundation. https://www.kff.org/racial-equity-and-health-policy/overview-of-health-coverage-and-care-for-individuals-with-limited-english-proficiency/

Kennedy, J., Wood, E. G., & Frieden, L. (2017). Disparities in insurance coverage, health services use, and access following implementation of the Affordable Care Act: A comparison of disabled and nondisabled working-age adults. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*. https://doi.org/10.1177/0046958017734031

Lu, T., & Myerson, R. (2020). Disparities in health insurance coverage and access to care by English language proficiency in the USA, 2006–2016. *Journal of General Internal Medicine, 35*, 1490–1497. https://doi.org/10.1007/s11606-019-05609-z

Appendix

(1) Table A1

Table A1: Sequential Covariate Testing for Model 1

Model Step	AIC	LRT p
ENG	16912.51	—
ENG + AGEP	15791.27	< .001
ENG + AGEP + SEX	15680.44	< .001
ENG + AGEP + SEX + RAC1P	15129.94	< .001
ENG + AGEP + SEX + RAC1P + HISP	15091.61	< .001
ENG + AGEP + SEX + RAC1P + HISP + SCHL	14567.57	< .001
ENG + AGEP + SEX + RAC1P + HISP + SCHL + ESR	14513.01	< .001
ENG + AGEP + SEX + RAC1P + HISP + SCHL + ESR + CIT	14044.41	< .001

(2) Table A2

Table A2: Sequential Covariate Testing for Model 2

Model Step	AIC	LRT p
ENG + DIS	16714.35	—
ENG + DIS + AGEP	15773.23	< .001
ENG + DIS + AGEP + SEX	15661.51	< .001
ENG + DIS + AGEP + SEX + RAC1P	15094.42	< .001
ENG + DIS + AGEP + SEX + RAC1P + HISP	15056.47	< .001
ENG + DIS + AGEP + SEX + RAC1P + HISP + SCHL	14512.25	< .001
ENG + DIS + AGEP + SEX + RAC1P + HISP + SCHL + ESR	14428.99	< .001
ENG + DIS + AGEP + SEX + RAC1P + HISP + SCHL + ESR + CIT	13990.95	< .001

(3) Table A3

Table A3: Sequential Covariate Testing for Model 3

Model Step	AIC	LRT p
ENG * DIS	16699.89	—
ENG * DIS + AGEP	15767.75	< .001
ENG * DIS + AGEP + SEX	15657.07	< .001
ENG * DIS + AGEP + SEX + RAC1P	15092.31	< .001
ENG * DIS + AGEP + SEX + RAC1P + HISP	15054.63	< .001
ENG * DIS + AGEP + SEX + RAC1P + HISP + SCHL	14513.15	< .001
ENG * DIS + AGEP + SEX + RAC1P + HISP + SCHL + ESR	14430.10	< .001
ENG * DIS + AGEP + SEX + RAC1P + HISP + SCHL + ESR + CIT	13992.67	< .001

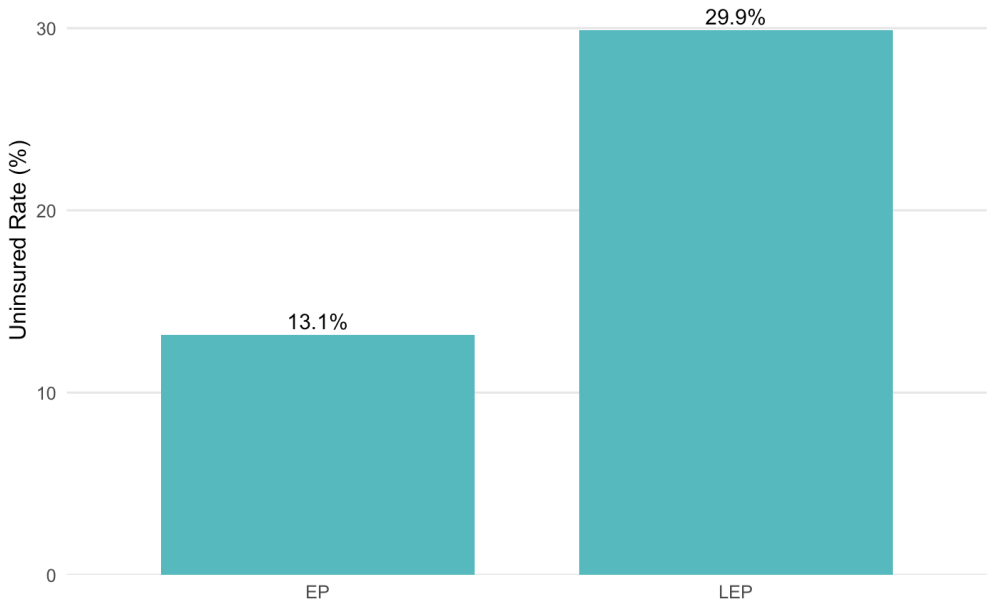
(4) Table A4

Table A4: Correlation Matrix for All Variables

	HICOV	DIS	ENG	AGEP	SEX	RAC1P	HISP	SCHL	ESR	CIT
HICOV	1.000									
DIS	-0.076	1.000								
ENG	0.161	0.095	1.000							
AGEP	-0.188	0.340	0.164	1.000						
SEX	0.073	-0.022	-0.044	-0.050	1.000					
RAC1P	0.120	-0.023	0.139	-0.095	0.000	1.000				
HISP	0.187	0.022	0.144	-0.095	0.016	0.593	1.000			
SCHL	-0.186	-0.134	-0.270	-0.110	-0.017	-0.177	-0.327	1.000		
ESR	-0.013	0.334	0.143	0.453	-0.177	-0.044	-0.018	-0.167	1.000	
CIT	0.257	-0.099	0.324	-0.167	0.027	0.145	0.108	-0.089	-0.045	1.000

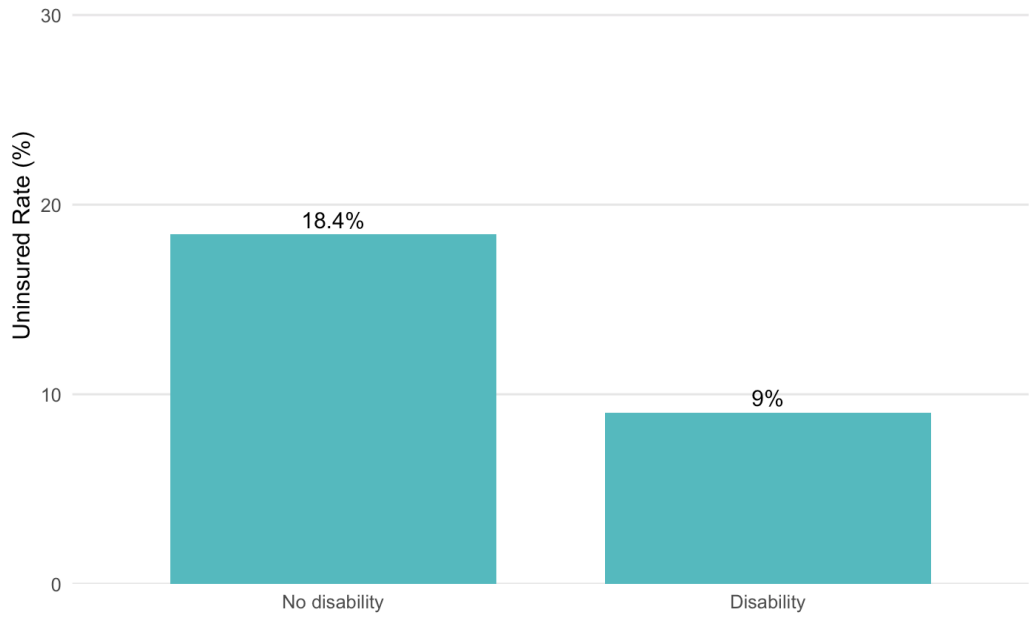
(5) Figure A1

Figure A1: Weighted Uninsured Rate by English Proficiency Status

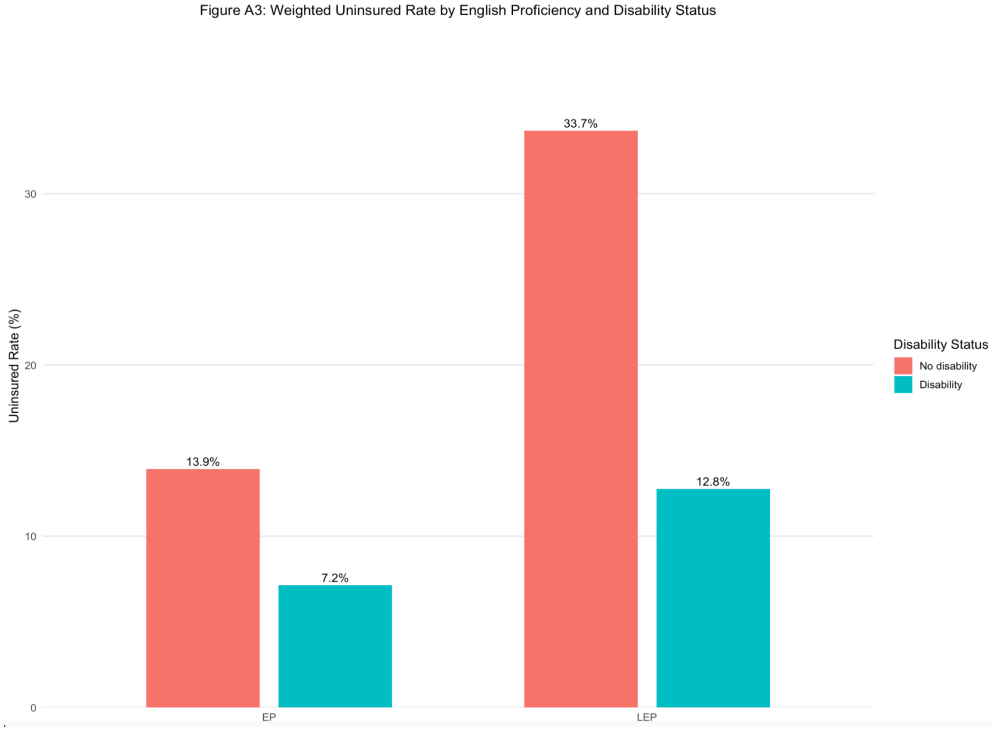


(6) Figure A2

Figure A2: Weighted Uninsured Rate by Disability Status



(7) Figure A3



(8) Table A5

Table A5: Logistic Regression Results for Model 1

Term	OR	Z Statistic	95% CI	p
Intercept	0.814	-1.90	0.658, 1.006	0.058
LEP	1.526	7.76	1.371, 1.698	< .001
Age	0.953	-27.52	0.950, 0.957	< .001
Male	1.511	9.17	1.383, 1.650	< .001
Race: Black	1.090	0.74	0.864, 1.368	0.460
Race: Indigenous	1.432	2.79	1.110, 1.837	0.005
Race: Asian	0.469	-8.57	0.394, 0.557	< .001
Race: NHPI	0.976	-0.06	0.429, 1.997	0.950
Race: Other race	1.009	0.12	0.869, 1.174	0.903
Race: Two or more races	1.179	2.23	1.020, 1.364	0.026
HISP_binary	1.187	2.24	1.022, 1.379	0.025
Education: No HS diploma	1.427	6.22	1.276, 1.597	< .001
Education: Some college	0.758	-3.88	0.659, 0.871	< .001
Education: Associate's	0.630	-4.70	0.518, 0.762	< .001
Education: Bachelor's	0.461	-10.20	0.397, 0.535	< .001
Education: Master's	0.205	-12.74	0.160, 0.260	< .001
Education: Prof/Doctoral	0.318	-5.75	0.211, 0.462	< .001
Employment: Unemployed	1.878	5.32	1.485, 2.364	< .001
Employment: Not in labor force	1.434	7.05	1.297, 1.586	< .001
Non-U.S. citizen	2.851	21.75	2.594, 3.133	< .001

[1] Nagelkerke R2 = 0.265

(9) Table A6

Table A6: Logistic Regression Results for Model 2

Term	OR	Z Statistic	95% CI	p
Intercept	0.776	-2.33	0.626, 0.960	0.020
LEP	1.536	7.86	1.380, 1.709	< .001
Disability	0.574	-7.18	0.493, 0.667	< .001
Age	0.955	-26.03	0.952, 0.958	< .001
Male	1.539	9.53	1.409, 1.682	< .001
Race: Black	1.071	0.59	0.849, 1.345	0.558
Race: Indigenous	1.462	2.94	1.131, 1.877	0.003
Race: Asian	0.459	-8.81	0.386, 0.546	< .001
Race: NHPI	0.974	-0.07	0.427, 1.996	0.946
Race: Other race	1.009	0.12	0.868, 1.174	0.903
Race: Two or more races	1.179	2.22	1.020, 1.364	0.027
HISP_binary	1.185	2.22	1.020, 1.378	0.027
Education: No HS diploma	1.439	6.35	1.287, 1.611	< .001
Education: Some college	0.755	-3.94	0.656, 0.868	< .001
Education: Associate's	0.627	-4.76	0.516, 0.758	< .001
Education: Bachelor's	0.455	-10.37	0.392, 0.528	< .001
Education: Master's	0.202	-12.85	0.158, 0.257	< .001
Education: Prof/Doctoral	0.311	-5.87	0.207, 0.452	< .001
Employment: Unemployed	1.952	5.63	1.543, 2.459	< .001
Employment: Not in labor force	1.556	8.46	1.404, 1.724	< .001
Non-U.S. citizen	2.767	21.04	2.517, 3.043	< .001

[1] Nagelkerke R2 = 0.265

(10) Table A7

Table A7: Logistic Regression Results for Model 3

Term	OR	Z Statistic	95% CI	p
Intercept	0.772	-2.36	0.622, 0.956	0.018
LEP	1.549	7.70	1.386, 1.732	< .001
Disability	0.593	-5.40	0.489, 0.714	< .001
Age	0.955	-25.98	0.952, 0.959	< .001
Male	1.538	9.52	1.408, 1.681	< .001
Race: Black	1.072	0.59	0.849, 1.345	0.555
Race: Indigenous	1.461	2.93	1.131, 1.876	0.003
Race: Asian	0.459	-8.80	0.386, 0.546	< .001
Race: NHPI	0.974	-0.07	0.427, 1.998	0.947
Race: Other race	1.010	0.13	0.869, 1.175	0.899
Race: Two or more races	1.179	2.22	1.020, 1.365	0.026
HISP_binary	1.185	2.22	1.020, 1.378	0.027
Education: No HS diploma	1.440	6.36	1.287, 1.612	< .001
Education: Some college	0.756	-3.93	0.657, 0.869	< .001
Education: Associate's	0.627	-4.74	0.516, 0.759	< .001
Education: Bachelor's	0.456	-10.34	0.392, 0.529	< .001
Education: Master's	0.203	-12.82	0.158, 0.257	< .001
Education: Prof/Doctoral	0.312	-5.86	0.207, 0.453	< .001
Employment: Unemployed	1.952	5.63	1.542, 2.458	< .001
Employment: Not in labor force	1.556	8.45	1.404, 1.723	< .001
Non-U.S. citizen	2.767	21.03	2.517, 3.042	< .001
LEP * Disability	0.922	-0.53	0.685, 1.240	0.594

[1] Nagelkerke R2 = 0.265