Supplemental Materials for:

Profiles of Social Determinants of Health and Change in Diabetes Status Among US Hispanic/Latino Adults: HCHS/SOL, 2008-2024

Initial SDoH Selection Process

Three additional social determinants of health (SDoH) were also considered for inclusion in the latent class analyses, including: health insurance, nativity status, and discrimination. However, these variables were excluded based on preliminary analyses and prior conceptual understanding. In preliminary ordinal regression models (weighted and accounting for the complex sampling design) that tested the association between each individual SDoH and V1 diabetes status, adjusting for covariates, the three excluded SDoH (insurance, nativity, and discrimination) were not statistically significantly associated with V1 diabetes status (all *Ps* > .10; see Supplemental Table S1). We started with this more liberal *p*-value, given the study goal to identify patterns of SDoH, rather than individual variables, that might be relevant to diabetes.

Moreover, these three variables presented conceptual and practical issues providing further rationale for omitting them from analyses. **Health insurance** at V1 (2008-2011) was coded dichotomously (*0 = no current health insurance, 1 = currently has health insurance*), with about half of participants reporting no current health insurance (49.22%). However, this number dropped to 24% by V2 (2014-2017), after the Affordable Care Act (established 2010) was passed, thus making health insurance a less-relevant factor in diabetes status changes over time in this cohort. **Nativity status** was considered as a proxy indicator of US acculturation, coded dichotomously as 0 = *not born in US 50 states/DC* (hereafter, foreign born), and 1 = *born in US 50 states/DC* (hereafter, US born). However, the protective health effects of being US born versus foreign born are complex and may depend on time spent living in the US (1,2), suggesting

this variable requires further understanding beyond a simple binary coding approach. **Ethnic discrimination** was evaluated using two items assessing direct and vicarious discrimination (rated from 0-6); items were reverse coded and summed so that higher values indicated less discrimination. Although perceived discrimination is often linked to poor mental health, some work suggests it is not as strongly or consistently linked with physical health outcomes (3,4). Our preliminary analyses showed that discrimination exhibited no association with V1 diabetes status in the HCHS/SOL population, making it very unlikely there would be an association longitudinally, and therefore does not fit with our goal of identifying groups with distinct profiles of SDoH with potential relevance to diabetes risk. Additionally, the two items used to ascertain discrimination may not capture the complexity or full range of unfair treatment that Hispanic/Latino adults may experience.

Supplemental Table S1

Associations of Baseline Diabetes Status with 12 Possible Social Determinants of Health (SDoH) Considered for Inclusion in LCA

	3-level Diabetes Status (V1)		
SDoH Variables	OR	95% CI	P
Income	0.92	0.87, 0.98	**0.004**
Education	0.82	0.77, 0.87	**<.001**
Employment status (0=not employed and not retired)	0.83	0.75, 0.93	**0.001**
Home ownership (0= rented or occupied without payment)	0.86	0.76, 0.96	**0.009**
Health insurance (0=no current health insurance)	0.97	0.88, 1.07	0.57
Acculturation: Language use	0.92	0.87, 0.97	**0.001**
Acculturation: Social Relations	0.92	0.85, 1.00	**0.062**
Nativity status (0=foreign born)	0.97	0.85, 1.12	0.71
Chronic Stress (reversed)	0.90	0.86, 0.94	**<.001**
Family Cohesion	0.99	0.99, 1.00	**0.007**
Social Support	0.99	0.97, 1.00	**0.019**
Discrimination (reversed)	1.00	0.97, 1.03	0.85

Note. N = 16,397 (cases missing outcome data were excluded). Diabetes status coded as *0 = normoglycemia, 1 = pre-diabetes, 2 = diabetes*. Each estimate was derived from a separate ordinal regression model in which 3-level diabetes status at baseline (V1) was regressed on one SDoH, adjusting for age, sex, Hispanic/Latino heritage, and field center. All models accounted for weights and complex sample design. Bolded *p*-values were considered statistically significant ($p < .10$) and corresponding SDoH variables were retained for further analyses.

Supplemental Table S2

Bivariate Correlations Among 12 Possible SDoH Considered for Inclusion in LCA

	1	2	3	4	5	6	7	8	9	10	11
1. Income	-										
2. Education	.25***	-									
3. Employment status (0 = not employed)	.21***	.09***	-								
4. Home ownership (0 = rented or occupied without payment)	.36***	.08***	.09***	-							
5. Health insurance (0 = no coverage)[a]	.10***	.03**	.06***	.09***	-						
6. Language acculturation	.24***	.22***	.00	.07***	.21***	-					
7. Social acculturation	.16***	.21***	.04***	.06***	.14***	.53***	-				
8. Nativity status (0 = foreign born)[a]	.15***	.13***	-.06***	.04***	.16***	.68***	.30***	-			
9. Chronic stress (reversed)	.12***	-.02	.12***	.07***	-.07***	-.12***	-.08***	-.09***	-		
10. Family cohesion	.08***	.12***	.06***	.04***	-.03*	-.07***	-.02	-.09***	.21***		
11. Social support	.20***	.20***	.06***	.09***	.02	.13***	.08***	.08***	.12***	.37***	-
12. Discrimination (reversed)[a]	.02*	.03***	-.03***	.01	-.02*	-.07***	-.08***	-.02*	.16***	.11***	.11***

Note. Total N= 16,415 (n's vary across coefficients, pairwise deletion used). Estimates are unweighted and not survey-adjusted.

[a]Excluded from main LCA and regression models.

*p < .05, **p < .01, ***p < .001

Supplemental Table S3

Fit Indices for Latent Class Analysis Models

Solution	No. Free Parameters	LL	AIC	BIC	sBIC	Entropy	LMRT	BLRT
2-Class	26	-143255.62	286563.23	286763.51	286680.89	0.898	11697.91	11818.46
3-Class	36	-141136.25	282344.51	282621.83	282507.42	0.885	4195.48	4238.72
4-Class	46	-139227.69	278547.39	278901.74	278755.55	0.845	4887.13	4937.49

Note. N = 16,371 (due to 44 cases with missing on all variables). Models are unweighted and not adjusted for survey design. LL = *Loglikelihood H0 Value.* AIC = *Akaike Information Criteria.* BIC = *Bayesian Information Criteria.* sBIC = *Sample Size Adjusted BIC.* LMRT = *Lo-Mendell-Rubin Adjusted Likelihood Ratio Test.* BLRT = *Bootstrapped Likelihood Ratio Test*. Lower AIC, BIC, and sBIC values indicate better model fit (5). Higher entropy indicates greater classification accuracy (entropy > .80 is preferrable; (6). LMRT and BLRT values for all models were statistically significant ($p < .001$), indicating that each specified solution (e.g., 4-class) provides a better fit than the solution with one less class (e.g., 3-class) (7).

References

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