Supplemental Material

SDC Methods

Geocoding

To facilitate the use of geolocation, a data element which is private health information, without requiring sharing among study sites, addresses were geocoded using DeGAUSS,[1] an offline, HIPAA-compliant software program. The software utilizes TIGER/Line files[2] put forth by the US Census Bureau to map street addresses to latitudinal and longitudinal coordinates that can be subsequently geospatially joined to counties and census tracts.[3] The program can identify addresses with minor lexical differences from published street names. The output includes a precision assessment. Only addresses that were geocoded to a range of addresses within a street segment ('range') were included in this analysis. Once addresses are linked to specified geographic areas (e.g., census tract), they can be linked to the wealth of area-based measures publically available for analysis. As noted above, participants were excluded from analyses if their addresses could not be obtained, geocoded, or if geocoding precision was not in 'range' precision.[1,4]

Table S1. Demographic characteristics of excluded participants

Characteristic	Overall N = 400 Mean ± SD or N (%)	Site Excluded N = 76 Mean ± SD or N (%)	Site Included N = 271 Mean ± SD or N (%)	Excluded Insufficient Data N = 53 Mean ± SD or N (%)	p-value
Age at MALT Enrollment (years)	9.64 ± 4.51	10.09 ± 4.699	9.5 ± 4.499	9.72 ± 4.327	0.5975
Age at Transplant (years)	2.88 ± 3.423	2.16 ± 2.719	3.01 ± 3.554	3.23 ± 3.563	0.1134
Gender					
Male	189 (47.25)	30 (39.47)	131 (48.34)	28 (52.83)	0.2678
Female	211 (52.75)	46 (60.53)	140 (51.66)	25 (47.17)	
Race					
Asian	25 (6.25)	9 (11.84)	13 (4.8)	3 (5.66)	0.0006
Black or African American	56 (14)	20 (26.32)	30 (11.07)	6 (11.32)	
White or Caucasian	268 (67)	34 (44.74)	195 (71.96)	39 (73.58)	
Other	51 (12.75)	13 (17.11)	33 (12.18)	5 (9.43)	
Primary Insurance					
Medicaid or equivalent and/or state funded children's services	156 (39)	21 (27.63)	114 (42.07)	21 (39.62)	<.0001
HMO/managed care	101 (25.25)	9 (11.84)	77 (28.41)	15 (28.3)	
Traditional private insurance	94 (23.5)	17 (22.37)	65 (23.99)	12 (22.64)	
Other	49 (12.25)	29 (38.16)	15 (5.54)	5 (9.43)	
Primary Caregiver's Marital Status					
Single-parent household	3 (0.75)	23 (30.67)	45 (16.73)	12 (22.64)	0.0258
Two-parent household	80 (20)	52 (69.33)	224 (83.27)	41 (77.36)	
Missing	317 (79.25)				
Primary Caregiver's Highest Education Level					
Some high school or less	22 (5.5)	11 (14.86)	28 (10.98)	4 (8.16)	0.3503
High school degree/GED	43 (10.75)	26 (35.14)	58 (22.75)	13 (26.53)	

Characteristic	Overall N = 400 Mean ± SD or N (%)	Site Excluded N = 76 Mean ± SD or N (%)	Site Included N = 271 Mean ± SD or N (%)	Excluded Insufficient Data N = 53 Mean ± SD or N (%)	p-value
Vocational school or some college	97 (24.25)	9 (12.16)	56 (21.96)	12 (24.49)	
College degree	77 (19.25)	21 (28.38)	79 (30.98)	15 (30.61)	
Professional or graduate degree	115 (28.75)	7 (9.46)	34 (13.33)	5 (10.2)	
Missing	46 (11.5)				
Primary Diagnosis					
Acute Liver Failure	44 (11)	12 (15.79)	28 (10.33)	4 (7.55)	0.0311
Biliary Atresia	193 (48.25)	36 (47.37)	135 (49.82)	22 (41.51)	
Other Cholestatic diseases	65 (16.25)	7 (9.21)	49 (18.08)	9 (16.98)	
Metabolic Diseases that primarily affect other organs	37 (9.25)	7 (9.21)	21 (7.75)	9 (16.98)	
Liver Malignancies	31 (7.75)	3 (3.95)	21 (7.75)	7 (13.21)	
Other	30 (7.5)	11 (14.47)	17 (6.27)	2 (3.77)	
Donor Type					
Deceased	309 (77.25)	51 (67.11)	218 (80.44)	40 (75.47)	0.0469
Living	91 (22.75)	25 (32.89)	53 (19.56)	13 (24.53)	

SD: Standard deviation, MALT: Medication Adherence in children who had a Liver Transplant; HMO: health maintenance organization; GED: General educational development

Figure S1. Distributions of deprivation index and MLVI for all included participants

MLVI: Medication Level Variability Index
Legend: a. MLVI across participants. One outlier was included in the reported analyses but not displayed in this figure (MLVI = 23.1). The data appeared to be right skewed. b. The deprivation index across all participants. The data appeared to be normally distributed.
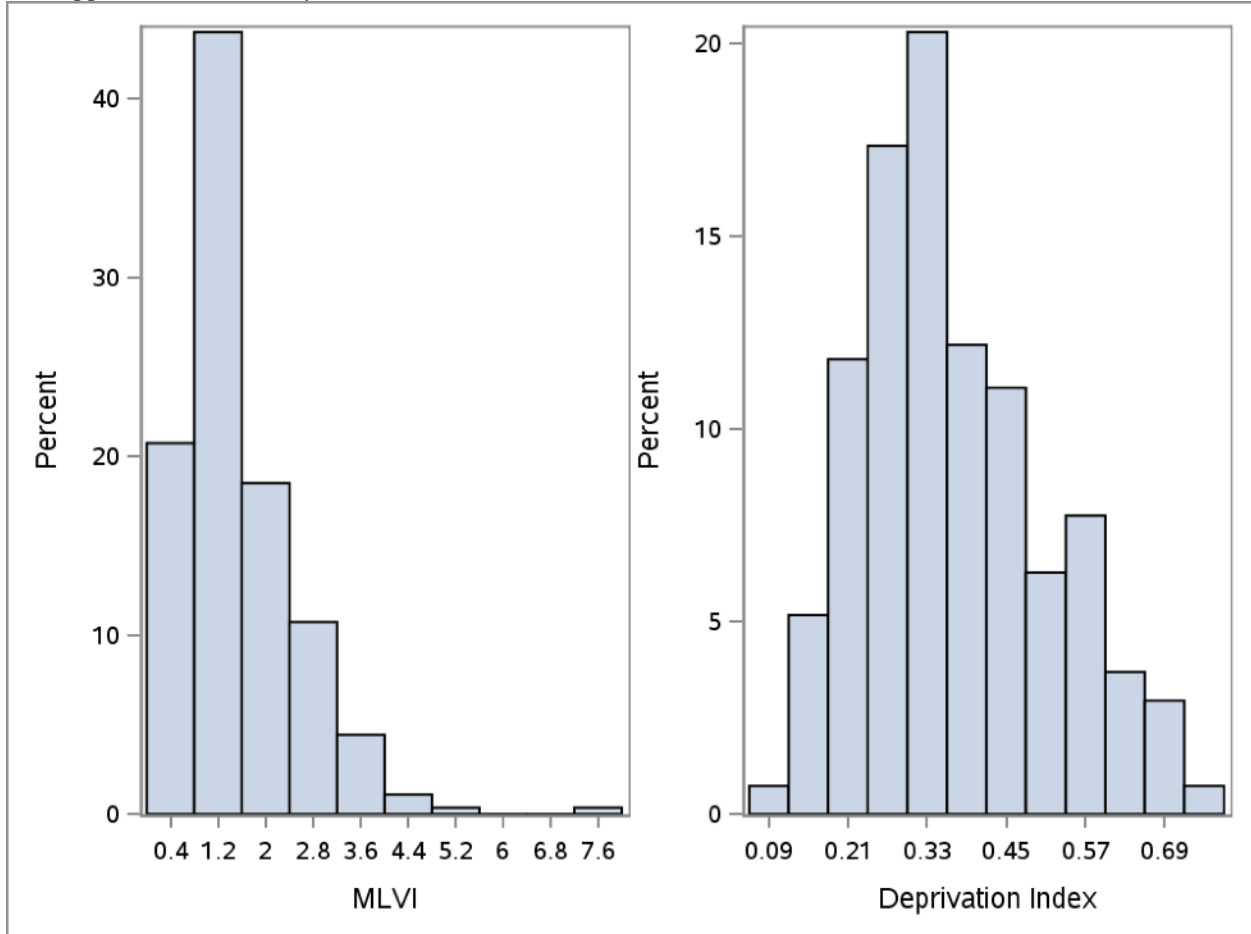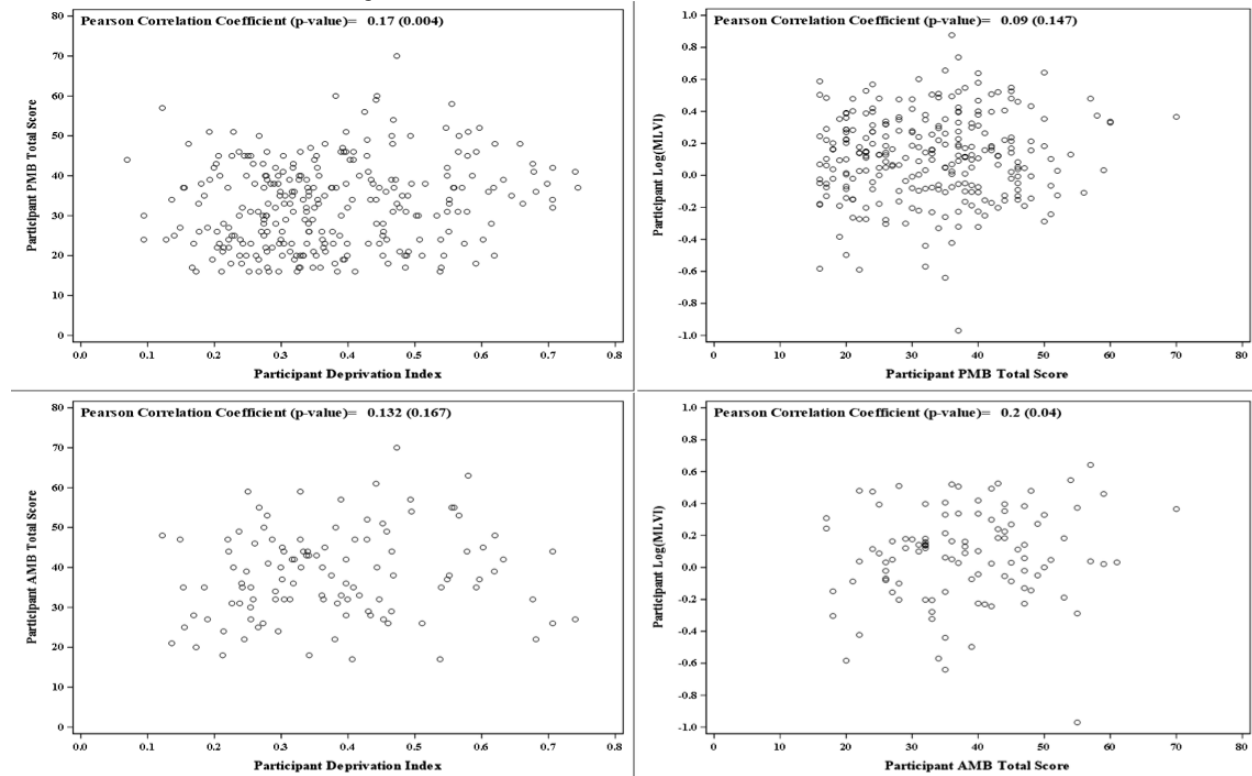
Figure S2. Scatter plots of total number of barriers to adherence identified on MLVI and deprivation index on total number of identified barriers for parents and adolescent participants.

PMB: Parent Medication Barriers Scale, AMB: Adolescent Medication Barriers Scale, MLVI: Medication level variability index

Legend: The deprivation index was associated with PMB (top left), however, the PMB was not associated with MLVI (top right). The deprivation index was not associated with AMB (bottom left), however, the AMB scale was associated with MLVI (bottom right).

References

1. Brokamp C, Wolfe C, Lingren T, et al. Decentralized and reproducible geocoding and characterization of community and environmental exposures for multisite studies. *J Am Med Inform Assoc.* 2019;25(3):309–314.
2. Geography UCB. TIGER/Line Shapefiles and TIGER/Line Files. United States Census Bureau website. 2012. Available at https://www.census.gov/geo/maps-data/data/tiger-line.html. Accessed September 2019.
3. Rossiter, K. Understanding geographic relationships: counties, places, tracts and more. United States Census Bureau Random Samplings website. 2014. Available at https://www.census.gov/newsroom/blogs/random-samplings/2014/07/understanding-geographic-relationships-counties-places-tracts-and-more.html. Accessed January 2020.
4. Brokamp C. Geocoding with DeGAUSS. DeGAUSS website. 2019. Available at https://github.com/degauss-org/DeGAUSS/wiki/Geocoding-with-DeGAUSS. Accessed January 2020.