



# The Frontier of Healthcare Optimization: Using Geo Mapping to Reach the Most Vulnerable Patients

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## BACKGROUND

- **Geo mapping** is used in healthcare to optimize equitable access to care.
- **Childhood Opportunity Index 2.0 (COI)** is a free, online Geo mapping tool that takes into account 29 indicators within 3 domains (education, health and environment, and social and economic),
- The COI scale is 0-100 with 100 representing the child with the highest opportunity to succeed, and COI is expressed in a 5-point scale (very low, low, moderate, high, very high).
- The **Texas Children's Mobile Clinic Program (TC-MCP)** provides free, high-quality care to under-resourced children in the greater Houston area through the use of three fully-equipped primary care mobile clinics.



- The TC-MCP English-Spanish bilingual pediatricians and nurse practitioners provide well child check-ups, sports/school physicals, vaccines, and illness care.
- TC-MCP supports lower socioeconomic status communities by visiting community centers, churches, and schools where >90% of children qualify for free or reduced lunch.

## OBJECTIVE

The purpose of this study was to use Geo mapping to examine and optimize TC-MCP clinic sites to reach the most vulnerable children in the greater Houston area.

## METHODS

- A retrospective electronic health record chart review of patients seen on board the mobile clinics from Jan 1-Dec 31, 2022 was conducted.
- Using Childhood Opportunity Index 2.0 (COI), we mapped COI for all patients seen based on census track data using home address and compared to nationally normed values.

## RESULTS

- 5,440 patients were seen from Jan 1-Dec 31, 2022

Table 1: Patient Demographics

Characteristic	N	%
Sex, n / N (%)	5,440	
F		2,707 / 5,440 (50%)
M		2,733 / 5,440 (50%)
Race, n / N (%)	4,969	
Asian		377 / 4,969 (7.6%)
Black		610 / 4,969 (12%)
Other		27 / 4,969 (0.5%)
White		3,955 / 4,969 (80%)
Ethnicity, n / N (%)	5,116	
Hispanic or Latino		4,021 / 5,116 (79%)
Not Hispanic or Latino		1,095 / 5,116 (21%)

Table 2: COI and COI Domains for All Patients Seen

COI- Overall	COI-Education Domain	COI-Health and Environment Domain	COI-Social and Economic Domain
Low/very low: 75%	Low/very low: 45%	Low/very low: 93%	Low/very low: 69%
Moderate: 14%	Moderate: 37%	Moderate: 5%	Moderate: 18%
High/very high: 11%	High/very high: 18%	High/very high: 2%	High/very high: 13%

Table 3: Overall COI by Insurance Status

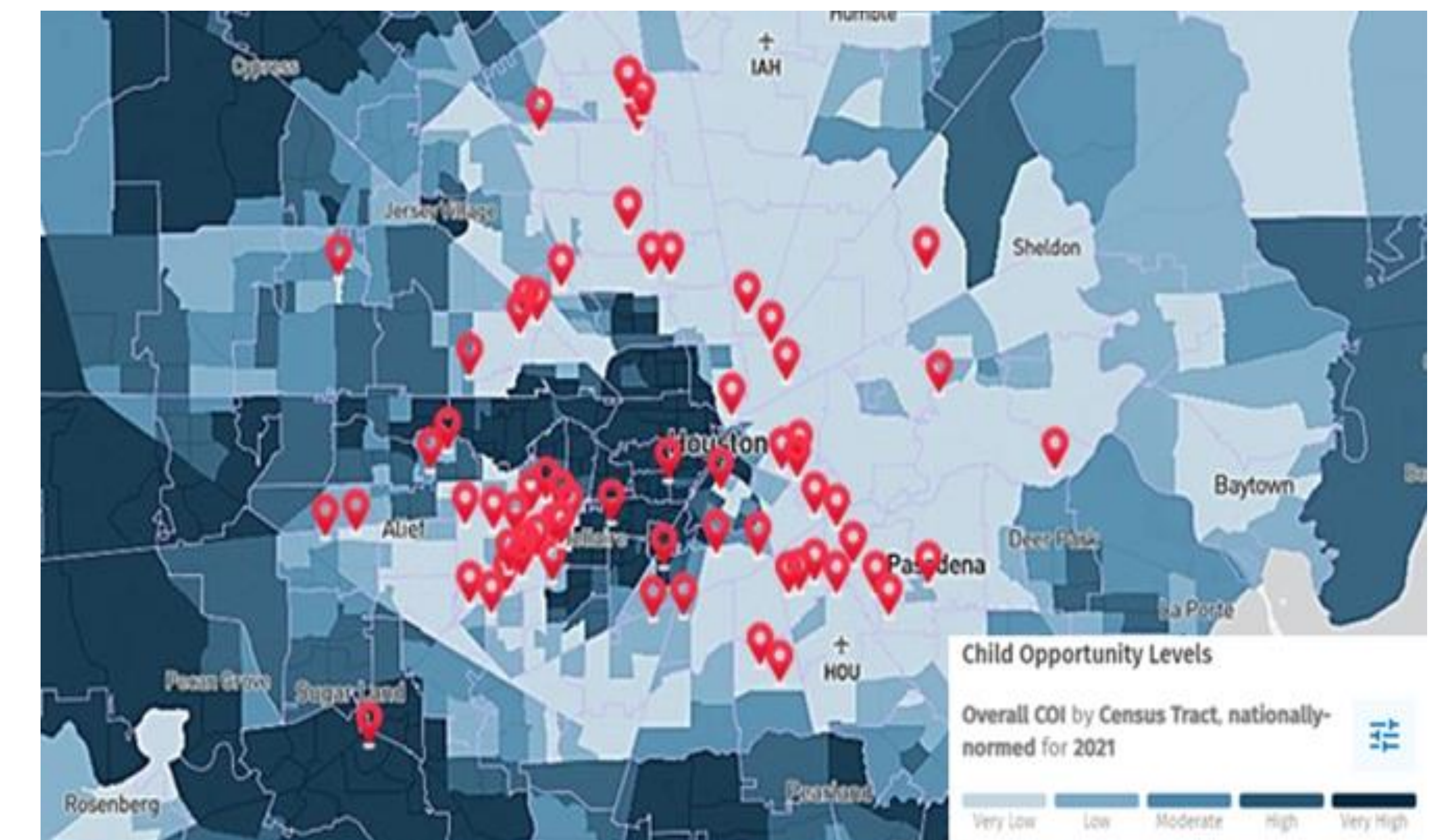
Overall COI	All Patients N = 5,422	Commercial N = 85	Medicaid/CHIP N = 617	Uninsured N = 4,720
Very Low	2,414 / 5,420 (45%)	19 / 85 (22%)	267 / 617 (43%)	2,128 / 4,718 (45%)
Low	1,611 / 5,420 (30%)	23 / 85 (27%)	200 / 617 (32%)	1,388 / 4,718 (29%)
Moderate	748 / 5,420 (14%)	19 / 85 (22%)	97 / 617 (16%)	632 / 4,718 (13%)
High	410 / 5,420 (7.6%)	13 / 85 (15%)	37 / 617 (6.0%)	360 / 4,718 (7.6%)
Very High	237 / 5,420 (4.4%)	11 / 85 (13%)	16 / 617 (2.6%)	210 / 4,718 (4.5%)

## RESULTS, cont.

Table 4: COI and COI Domains Based on Ethnicity

COI	Overall N=5116	HISPANIC/LATINO N = 4,021	NOT HISPANIC/LATINO N = 1,095
Very Low	2,282 / 5,114 (45%)	1,892 / 4,019 (47%)	390 / 1,095 (36%)
Low	1,516 / 5,114 (30%)	1,160 / 4,019 (29%)	356 / 1,095 (33%)
Moderate	710 / 5,114 (14%)	542 / 4,019 (13%)	168 / 1,095 (15%)
High	383 / 5,114 (7.5%)	259 / 4,019 (6.4%)	124 / 1,095 (11%)
Very High	223 / 5,114 (4.4%)	166 / 4,019 (4.1%)	57 / 1,095 (5.2%)

Figure 1: Locations of 2022 Clinic Sites Over COI 2.0 Map of Houston



## CONCLUSIONS

- Although the majority (75%) of our patients live in areas of low or very low COI, 11% are in overall areas of high/very high COI.
- Strategically modifying our sites to only visit areas of low or very low COI may help us reach the most vulnerable children in our area.
- Increasing our outreach in the lowest COI areas may increase our patient numbers from those areas.

- References available upon request.
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