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The Geography of Child Opportunity: Why Neighborhoods Matter for Equity

Introducing the Child Opportunity Index 2.0

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What is the Child Opportunity Index 2.0?

The COI is a data tool that measures the neighborhood conditions and resources that matter for children's healthy development:

- Availability of quality early childhood education centers
- Academic proficiency and graduation rates
- Air pollution levels
- Availability of green spaces and healthy food
- Housing vacancy and home ownership rates
- Poverty and employment rates
- Share of adults with high-skill jobs

What is the Child Opportunity Index 2.0?

The COI data include Child Opportunity Scores by neighborhood, metro area and racial/ethnic group.

- Maps and data visualizations

For the first time, there is a single, consistent metric of contemporary child opportunity for every neighborhood in the United States (72,000 neighborhoods).

- This allows us to assess and compare children's neighborhood opportunity across the entire country

Team and funders

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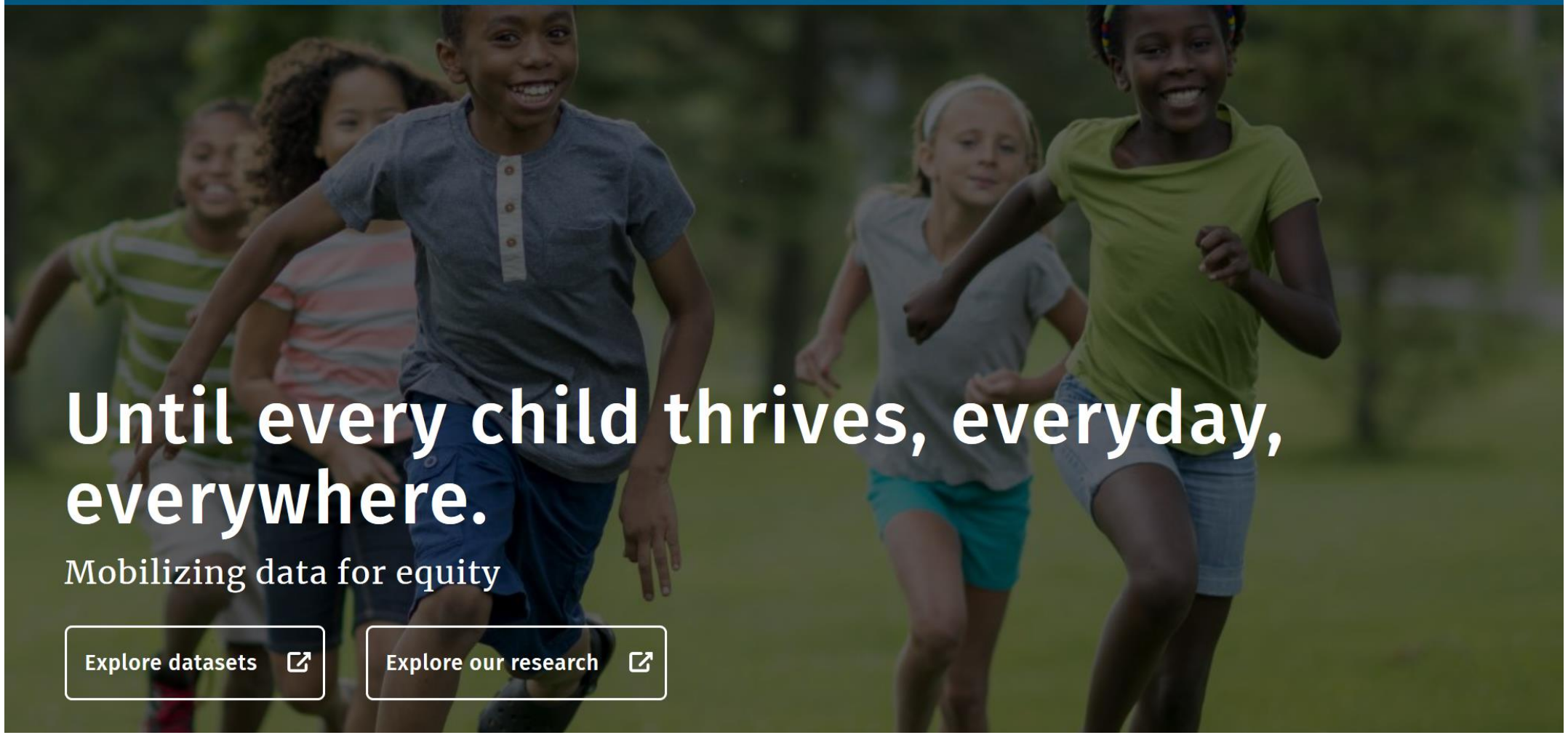
Until every child thrives, everyday, everywhere.
Mobilizing data for equity
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Explore our research

Why do neighborhoods matter?

Family factors (e.g., family poverty) matter for children's healthy development, and

the neighborhoods where children grow up matter too…

Neighborhoods influence the quality of experiences children have today

- Green space and playgrounds
- Quality of early childhood education
- School quality

Neighborhoods influence children's health and education

- Air quality
- Access to healthy food
- Walkability
- Heat
- Neighborhood schools: teacher experience, poverty rate, educational achievement

Neighborhoods influence children's norms and expectations for the future

- **Graduation rates in neighborhood schools**
- **College attendance**
- **Employment prospects**

Because of their influence during critical developmental years, neighborhoods also influence children's long-term outcomes as adults

- **Health and life expectancy**
- **Adult income**
- **Adult family formation**

Why the Child Opportunity Index 2.0?

We need rigorous data to monitor and improve children's neighborhoods

- Measures of contemporary child opportunity: the quality of children's neighborhood as they experience them today.

- Measures that capture the many dimensions of neighborhoods that matter for children—not just a single indicator such as the poverty rate.

- Longitudinal measures to monitor if children's neighborhoods are improving over time.

Neighborhood indicators in the Child Opportunity Index 2.0

Education

Early childhood education
- Early childhood education centers
- High-quality early childhood education centers
- Early childhood education enrollment

Elementary education
- Third grade reading proficiency
- Third grade math proficiency

Secondary and postsecondary education
- High school graduation rate
- Advanced Placement course enrollment
- College enrollment in nearby institutions

Educational and social resources
- School poverty
- Teacher experience
- Adult educational attainment

Health and Environment

Healthy environments
- Access to healthy food
- Access to green space
- Walkability
- Housing vacancy rate

Toxic exposures
- Hazardous waste dump sites
- Industrial pollutants in air, water or soil
- Airborne microparticles
- Ozone concentration
- Extreme heat exposure

Health resources
- Health insurance coverage

Social and Economic

Economic opportunities
- Employment rate
- Commute duration

Economic and social resources
- Poverty rate*
- Public assistance rate*
- Homeownership rate*
- High-skill employment*
- Median household income*
- Single-headed households

Types of stories we can tell with the Child Opportunity Index 2.0

- **Local stories: metro (state, city, county)**
    - Can zoom in and look at specific neighborhoods and children who live there
    - Can develop granular narratives for each neighborhood (based on 29 indicators)

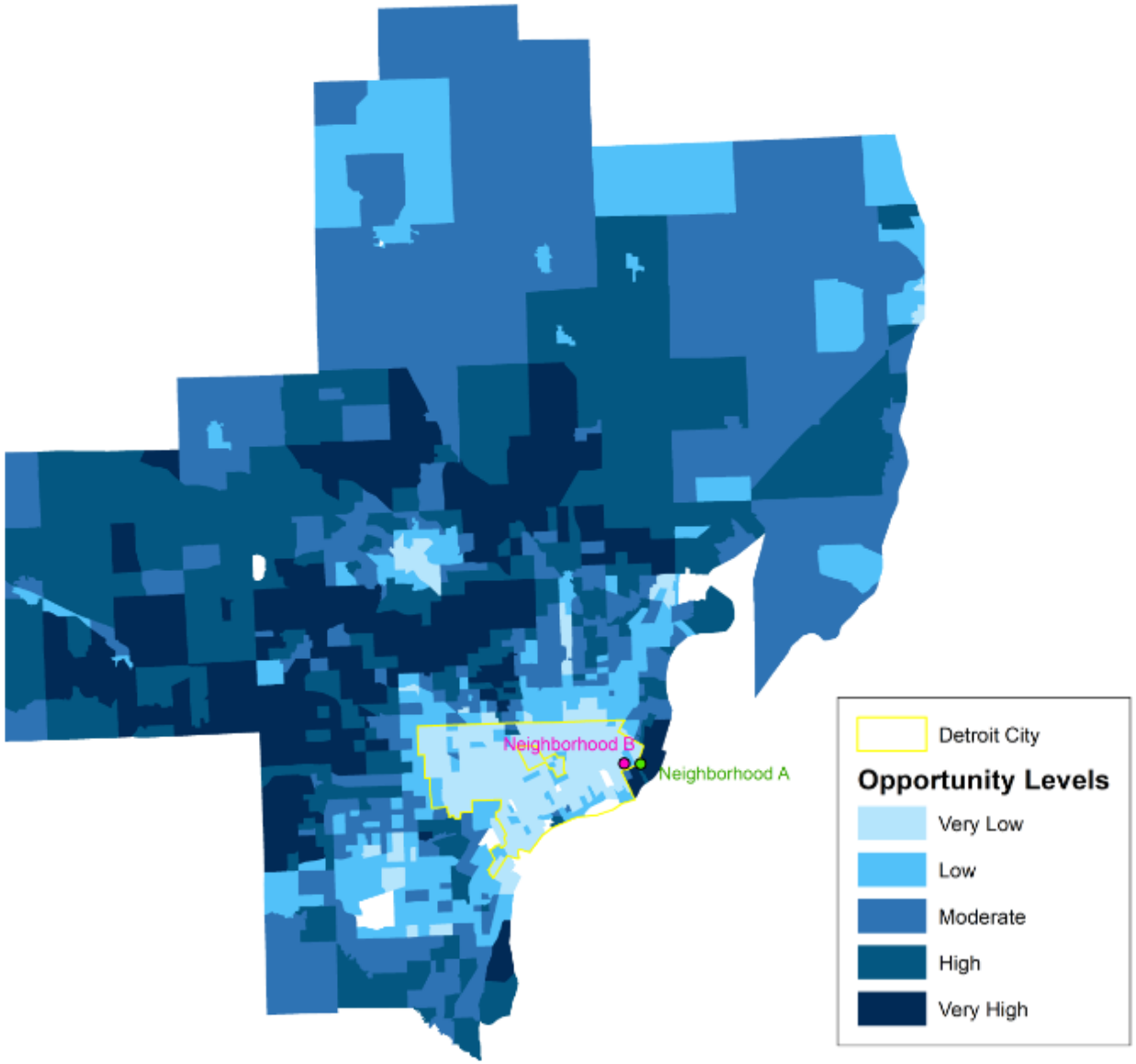
- **National level stories**
    - Variation in child opportunity
    - Extent of inequity in child opportunity

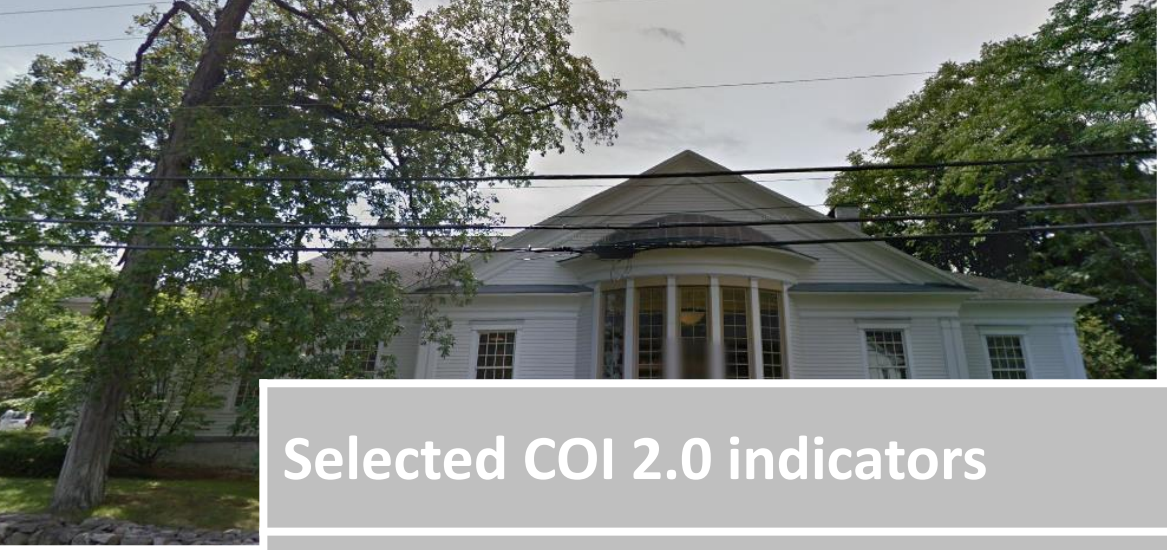
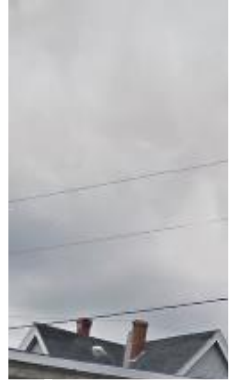
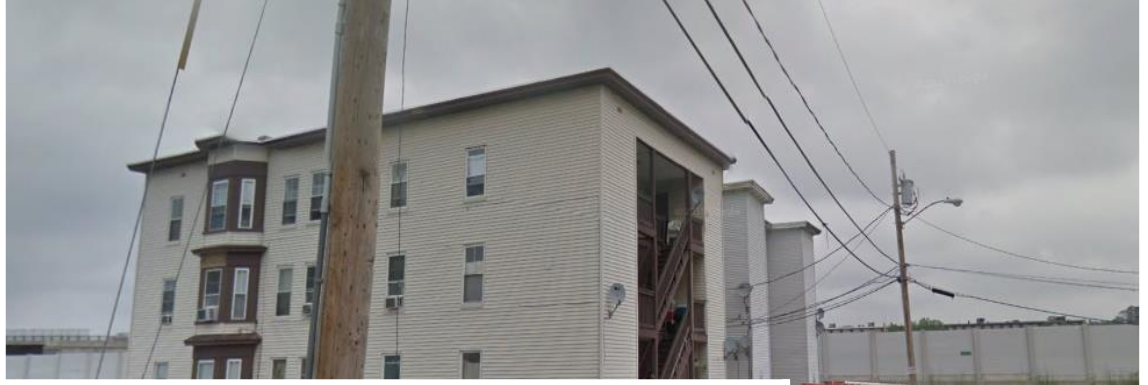
What can the Child Opportunity Index 2.0 tell us?

- How does child opportunity in a metro compare to the rest of the nation? (Child Opportunity Score by metro)
- Which and where are the neighborhoods with the highest and lowest levels of child opportunity? (Child Opportunity Score by neighborhood)
- What is the extent of inequality between lower and higher opportunity neighborhoods? (Child Opportunity Gap)
- How difficult are the conditions for a child in a very low opportunity neighborhood in a given metro compared to other metros? (Child Opportunity Score by opportunity level by metro)
- Do all children enjoy access to higher opportunity neighborhoods or are there racial/ethnic inequities? (Racial/ethnic Child Opportunity Gap)

Two Detroit neighborhoods

Detroit Child Opportunity map
A few miles away, a world apart in child opportunity

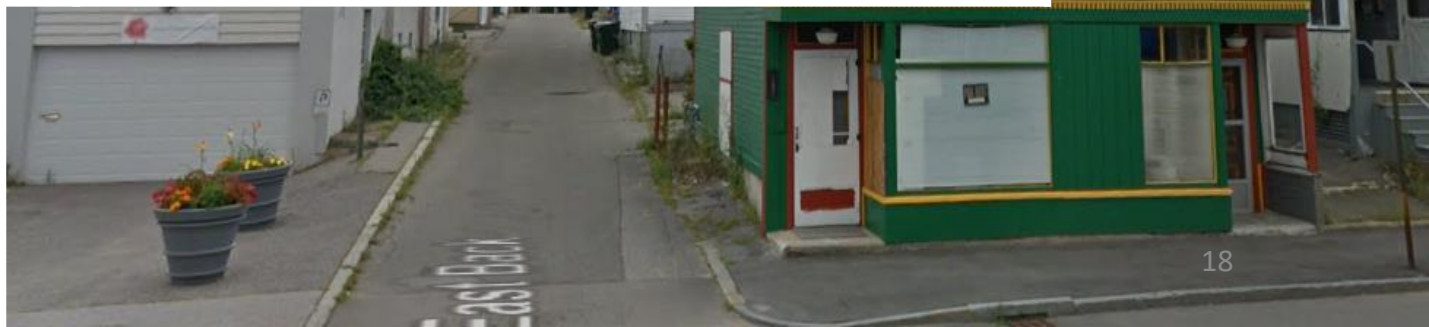



Selected COI 2.0 indicators	Neighborhood A	Neighborhood B
Neighborhood poverty rate	4.6%	52.2%
Enrollment in early childhood education	52.3%	30%
Lack of green space	39%	59.5%
Limited proximity to healthy food	0.2%	11.2%
Housing vacancy rate	0.3%	27.6%

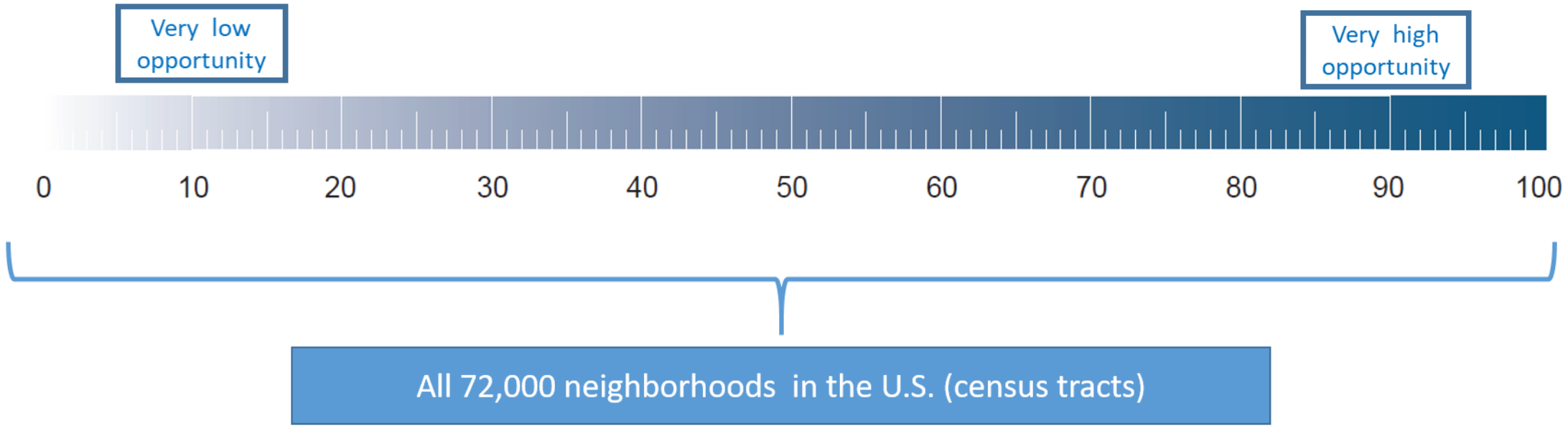






Child Opportunity Score

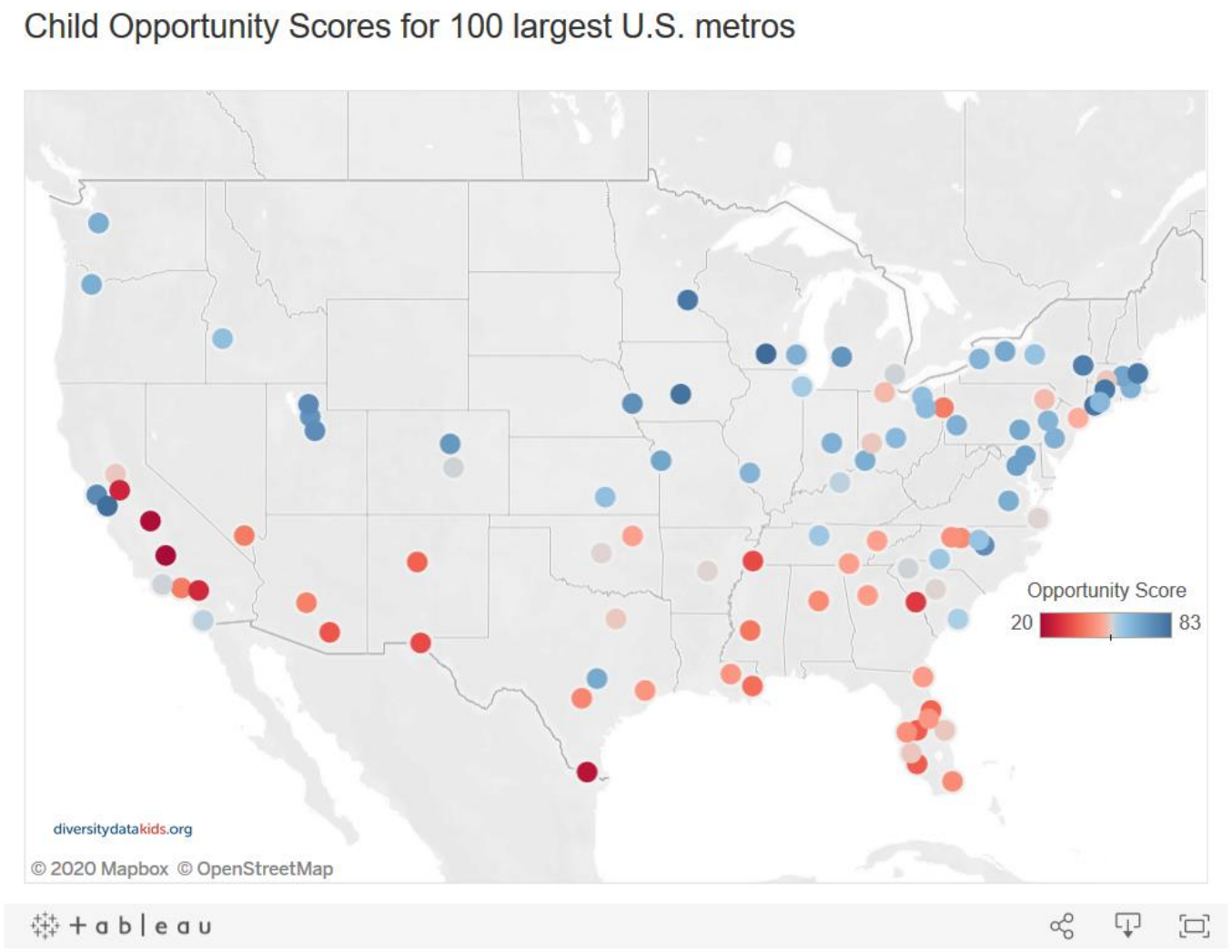
- A single metric (from 1 to 100) that ranks all 72,000 neighborhoods in the U.S. according to their percentile in the national child opportunity distribution.



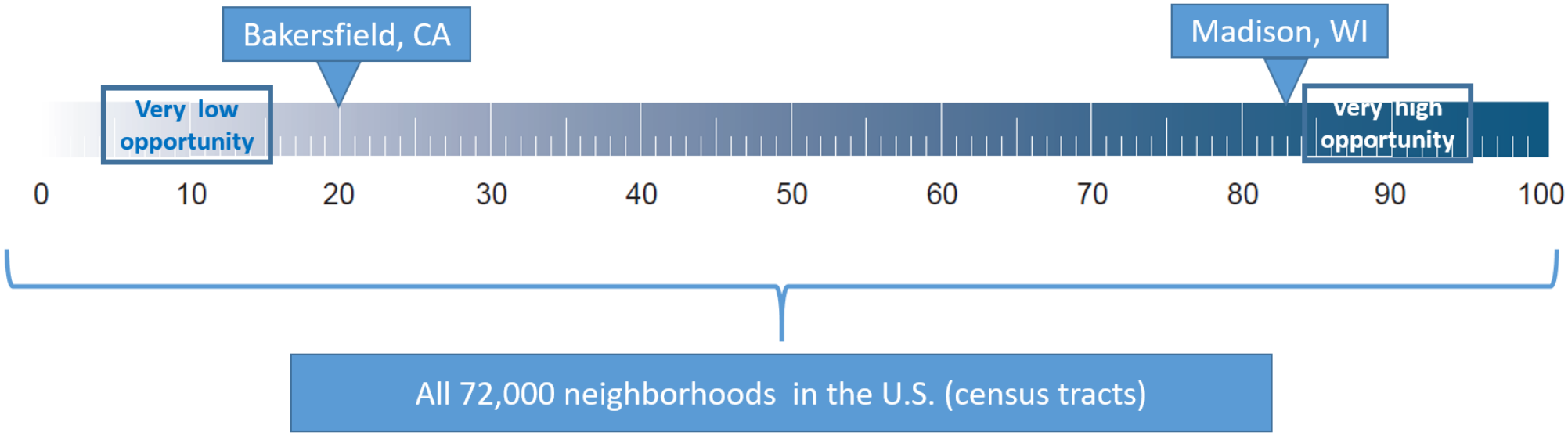
Child Opportunity Levels

- Each neighborhood is assigned to one of five opportunity levels (very low, low, moderate, high or very high). Each levels contains 20% of the child population.

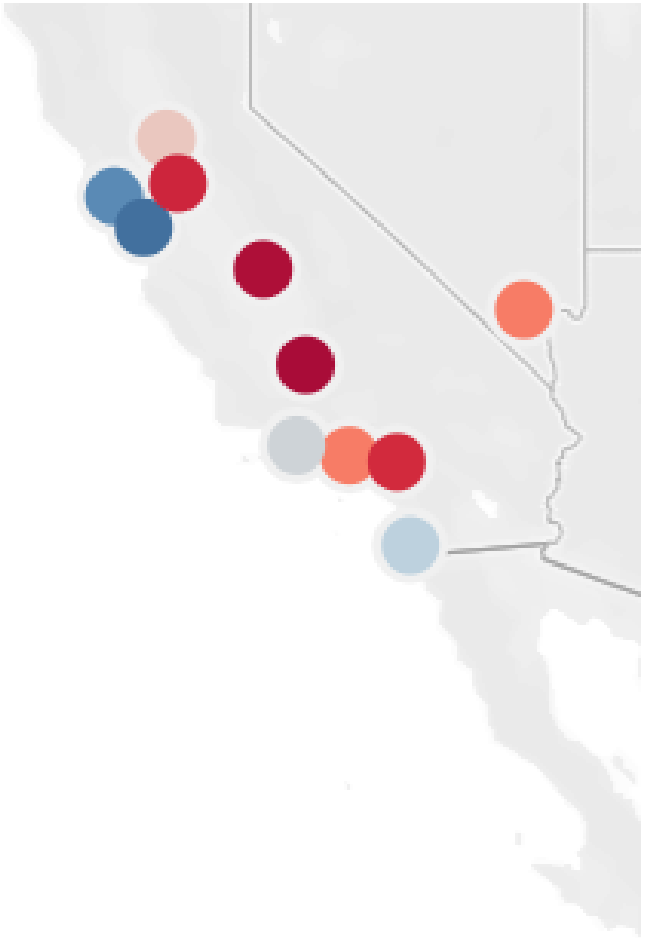
National geography of opportunity
Metros in the South have lower child opportunity



Child Opportunity Scores in the 100 largest metros: from Bakersfield (20) to Madison (83)



National geography of opportunity
There are vast geographic inequities between metros in California



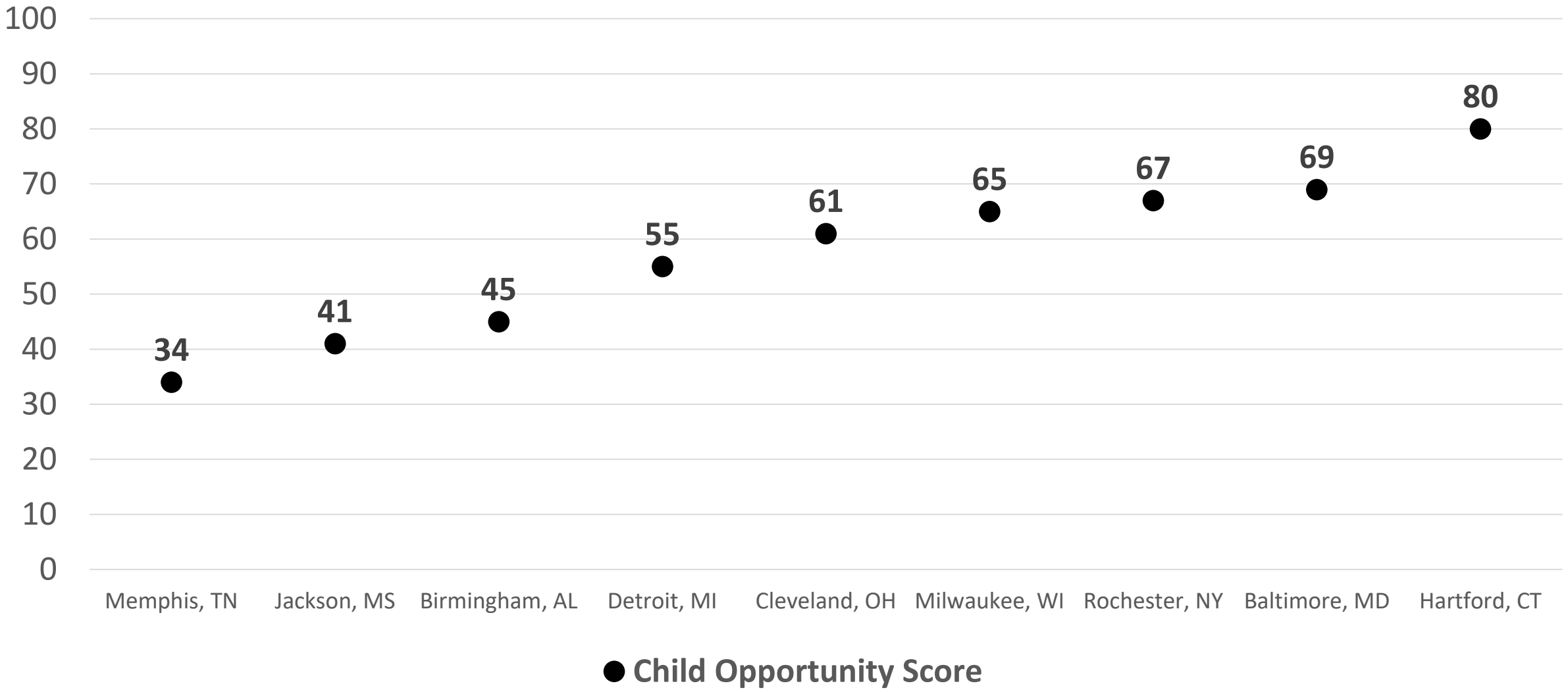
Bakersfield has the lowest Child Opportunity Score (20) in the country

San Jose has the second highest Child Opportunity Score (82) in the country

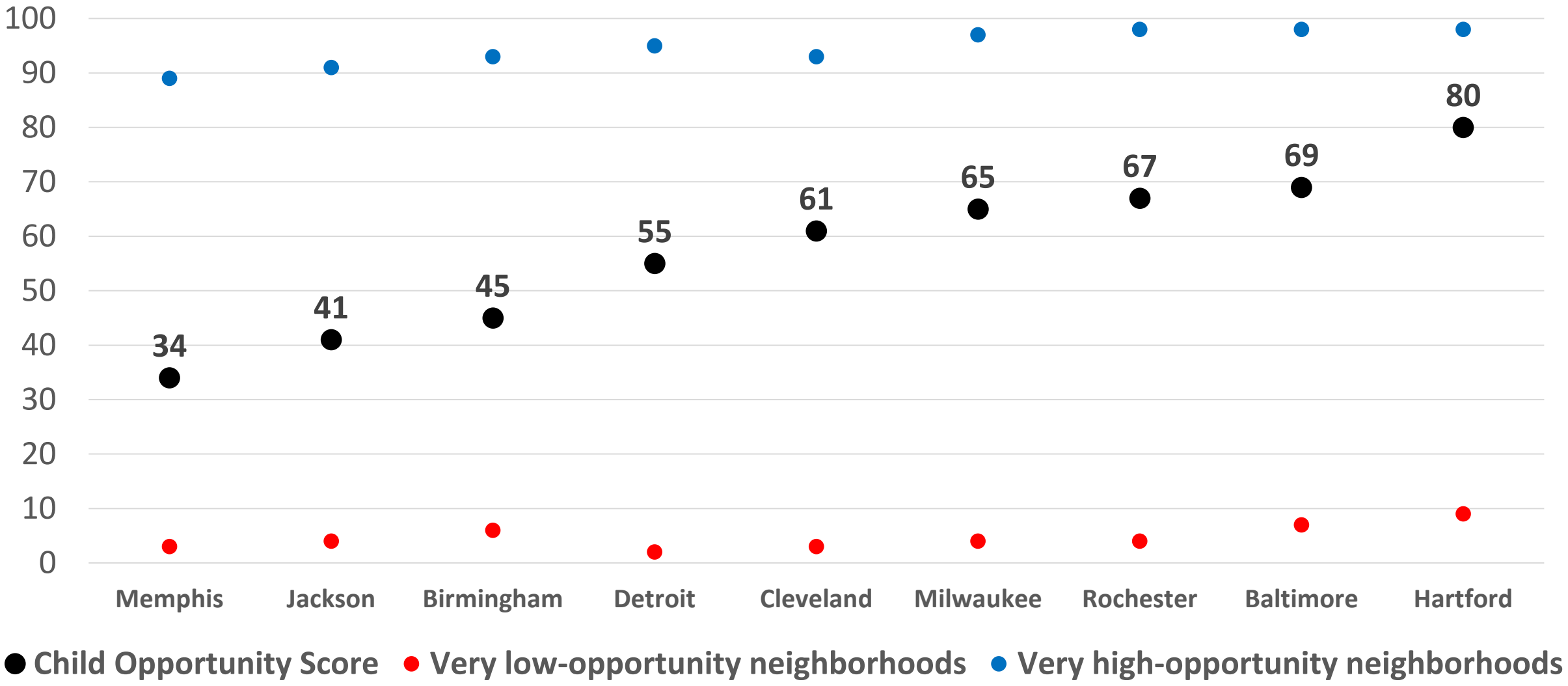
Child Opportunity Gap

How different is child opportunity in very-low opportunity neighborhoods than in very high-opportunity neighborhoods?

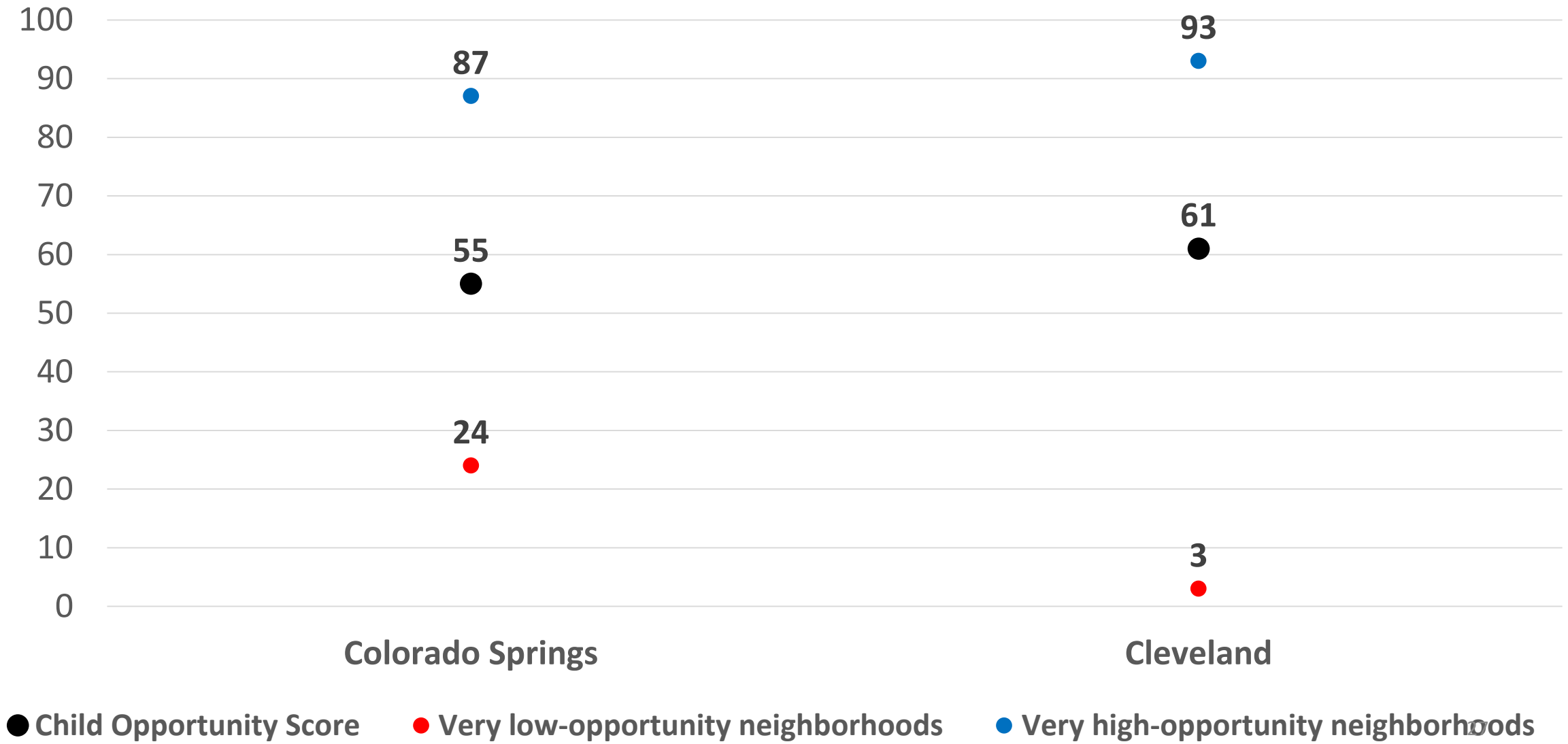
Child Opportunity Score for selected metros



Opportunity gap in selected metros
Opportunity hoarding

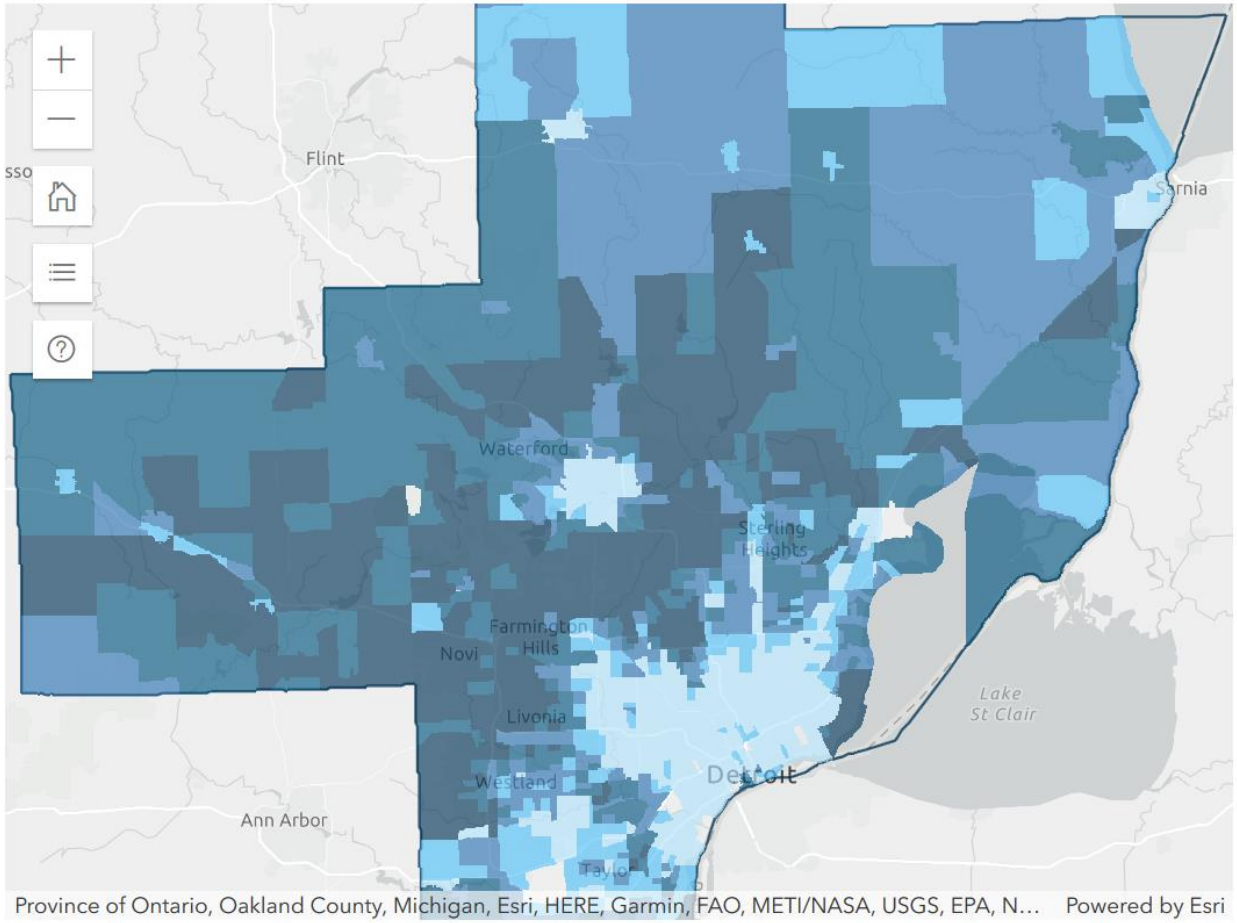


It is less difficult for a child to live in a very low-opportunity neighborhood in a sharing metro (Colorado Springs) than in a hoarding metro (Cleveland)



Race and ethnicity are the strongest predictors of child neighborhood opportunity

Where do children live in relation to opportunity?



Choose a Metro

Detroit-Warren-Dearborn, MI

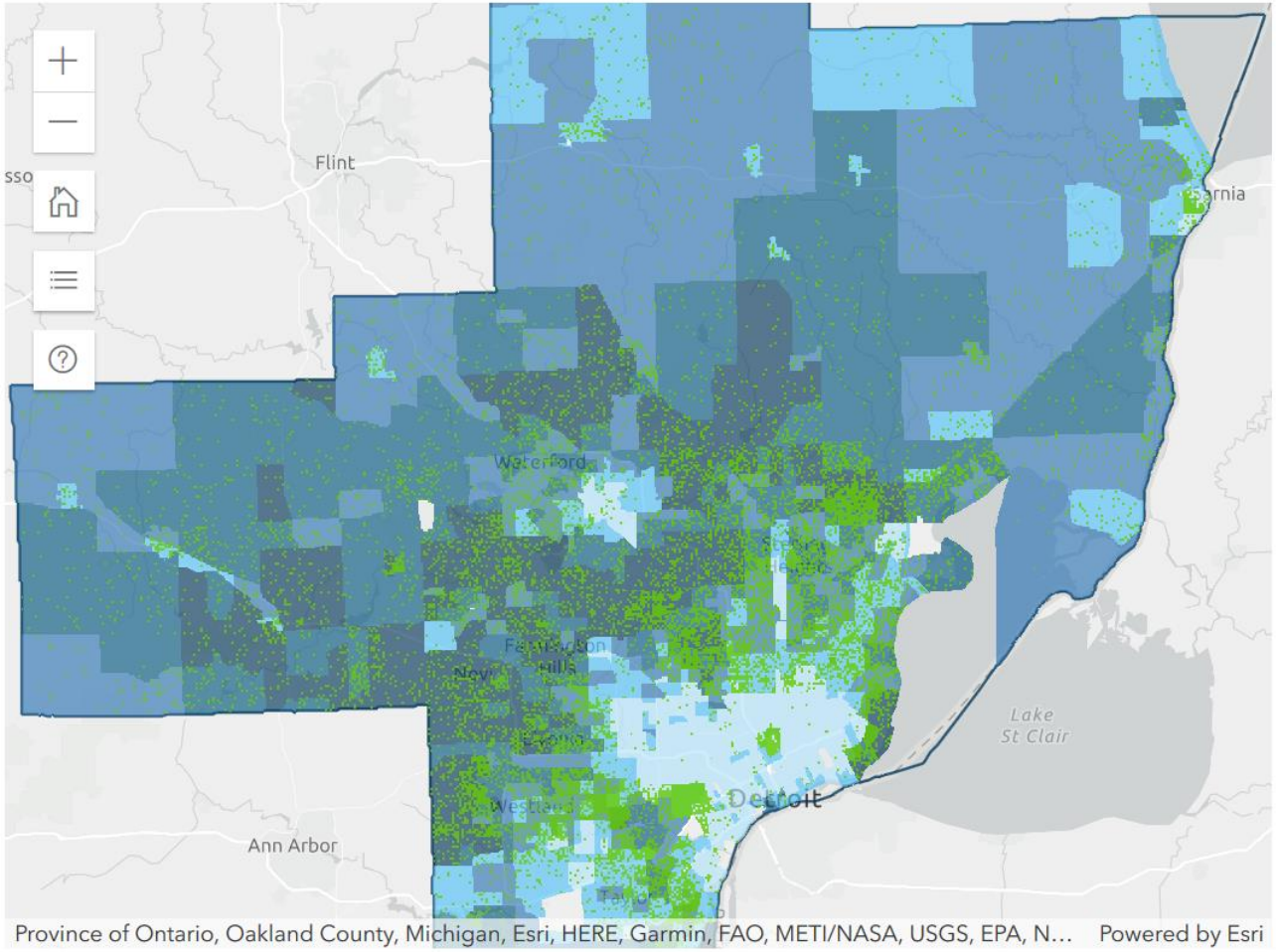
Choose Index

Overall

Child Population Overlay

- White
- Hispanic
- Black
- Asian
- American Indian

White children in metro Detroit



Choose a Metro

Detroit-Warren-Dearborn, MI

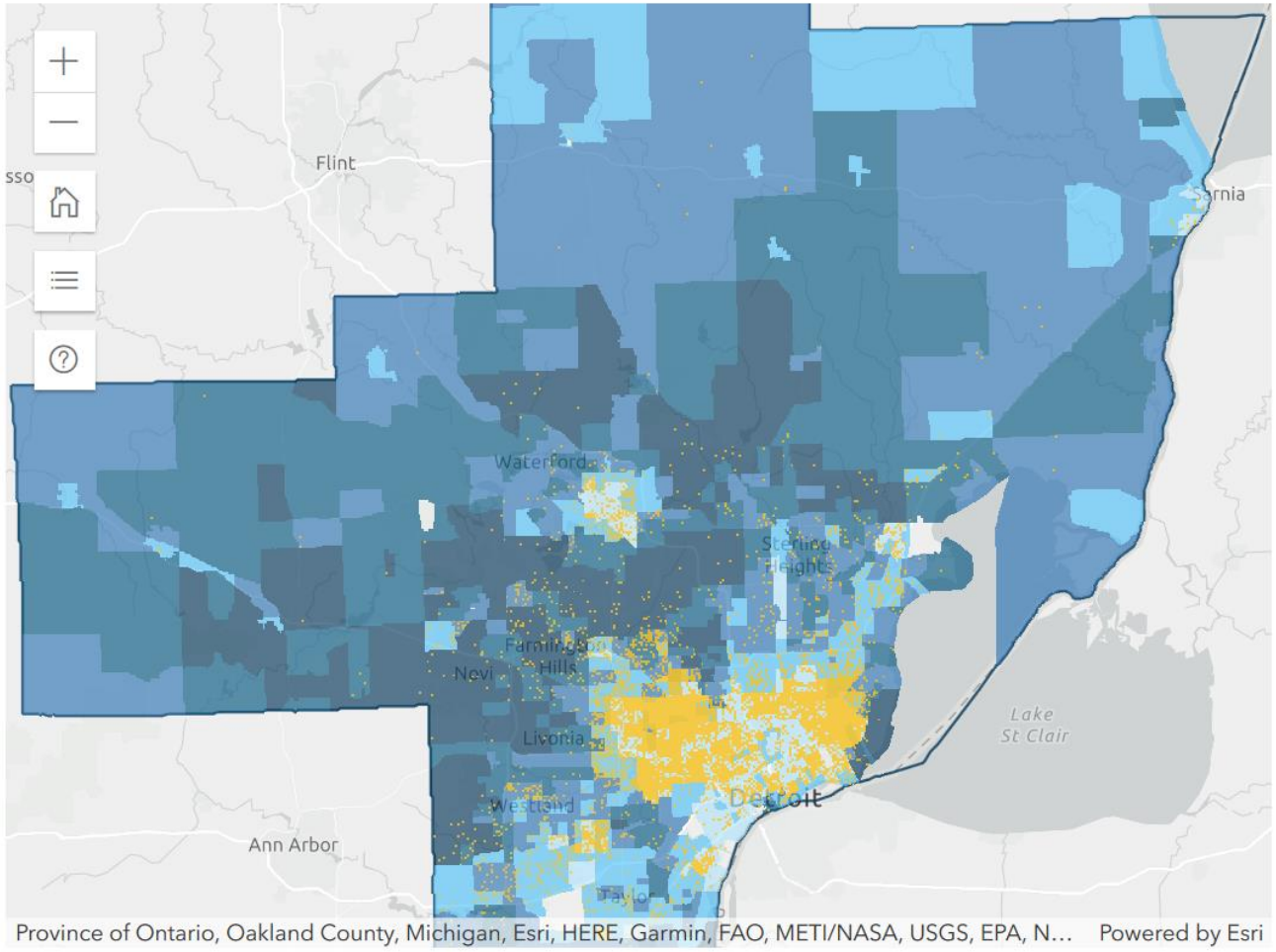
Choose Index

Overall

Child Population Overlay

- [x] White
- [ ] Hispanic
- [ ] Black
- [ ] Asian
- [ ] American Indian

Black children in metro Detroit



Choose a Metro

Detroit-Warren-Dearborn, MI

Choose Index

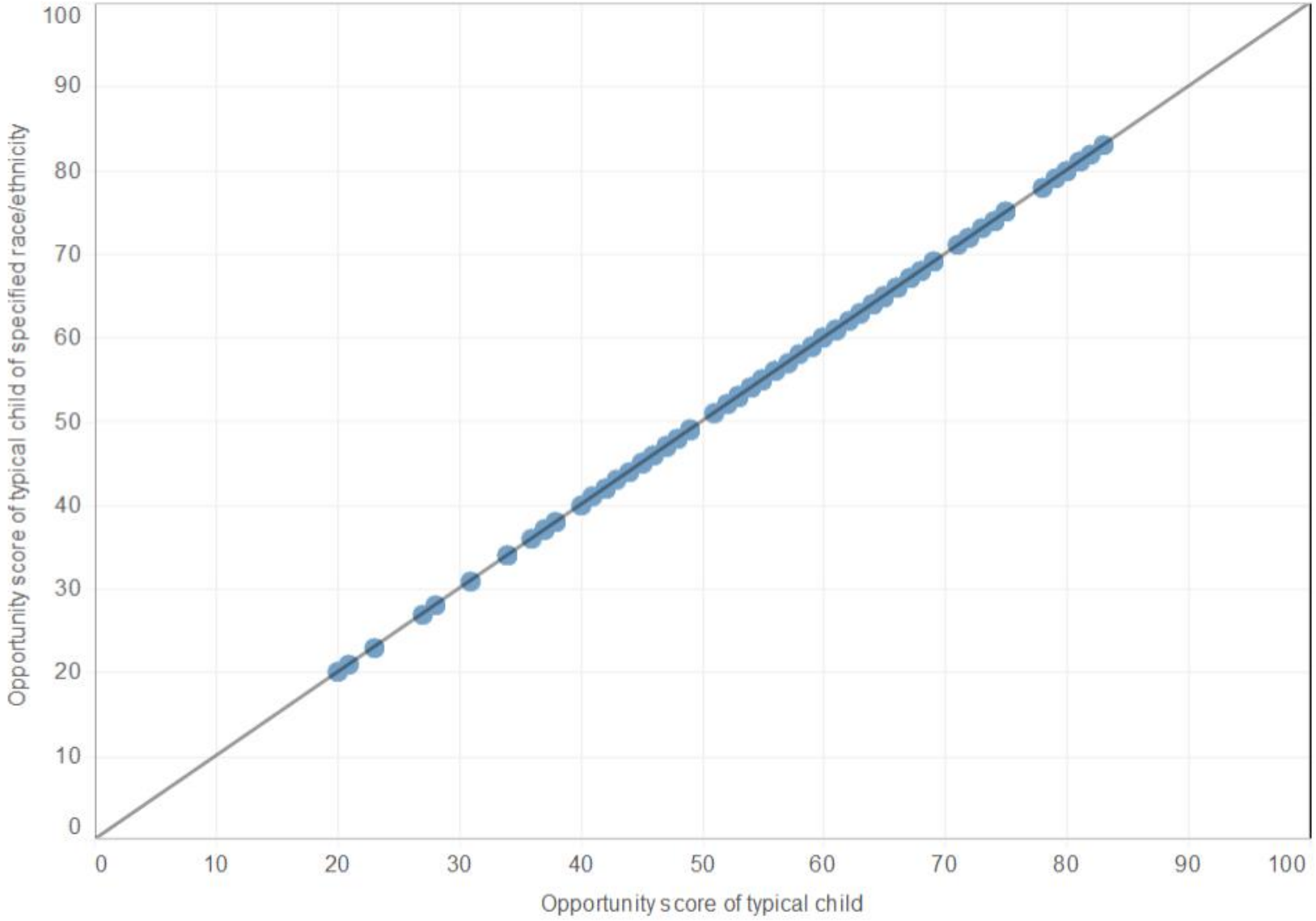
Overall

Child Population Overlay

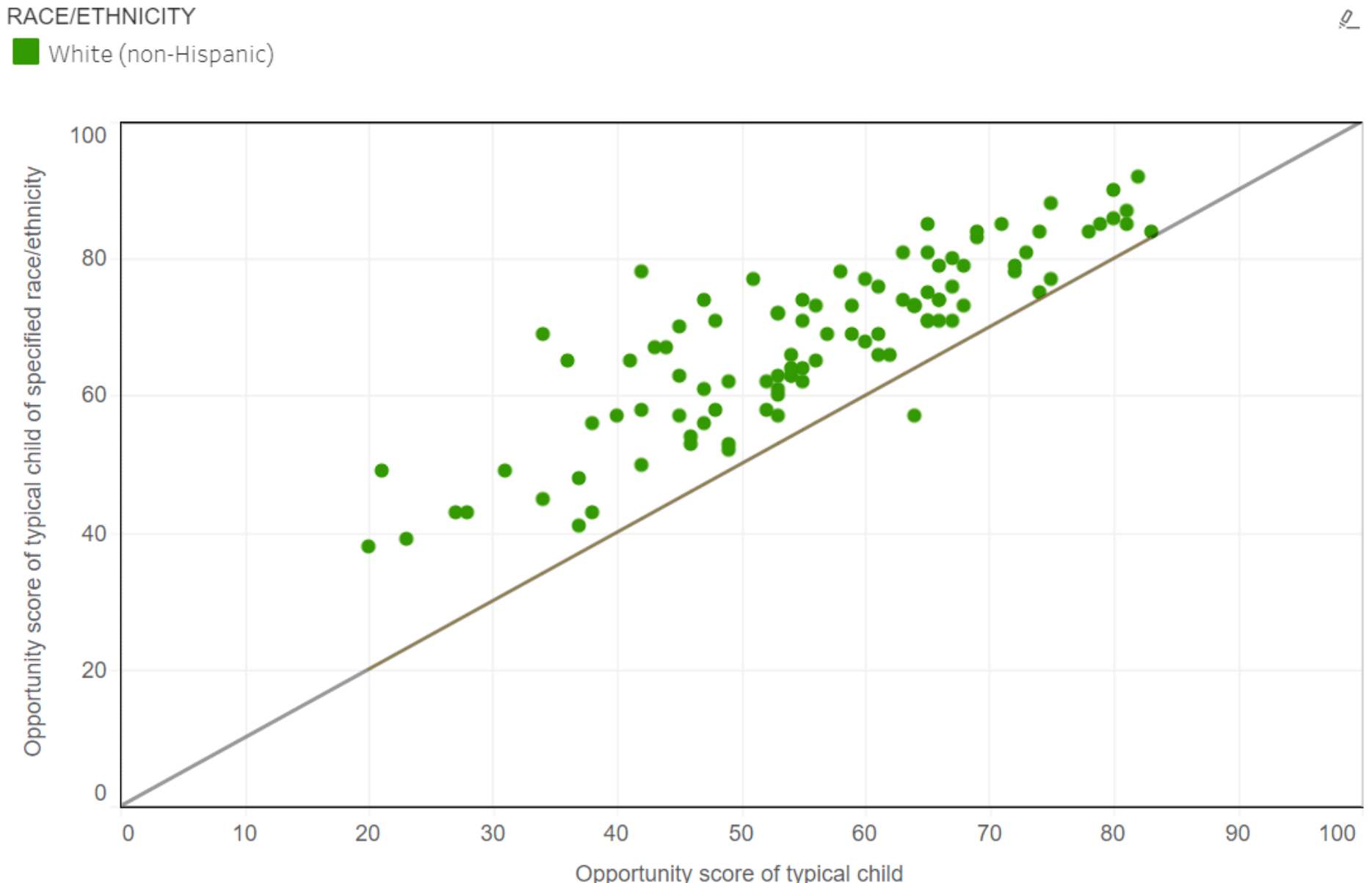
- [ ] White
- [ ] Hispanic
- [x] Black
- [ ] Asian
- [ ] American Indian

If all children lived in neighborhoods with similar opportunity

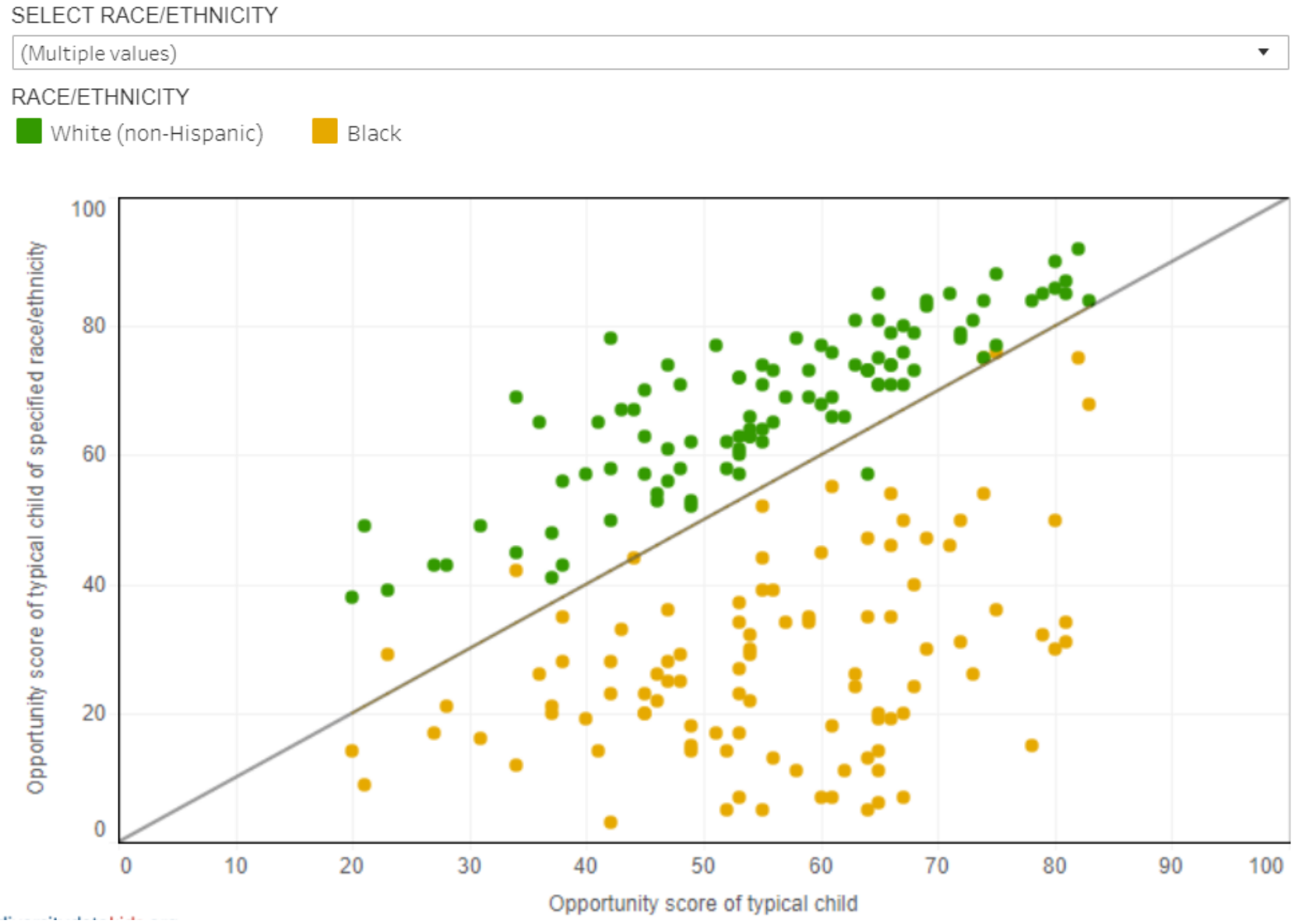
(Hypothetical equitable distribution of Child Opportunity Scores)



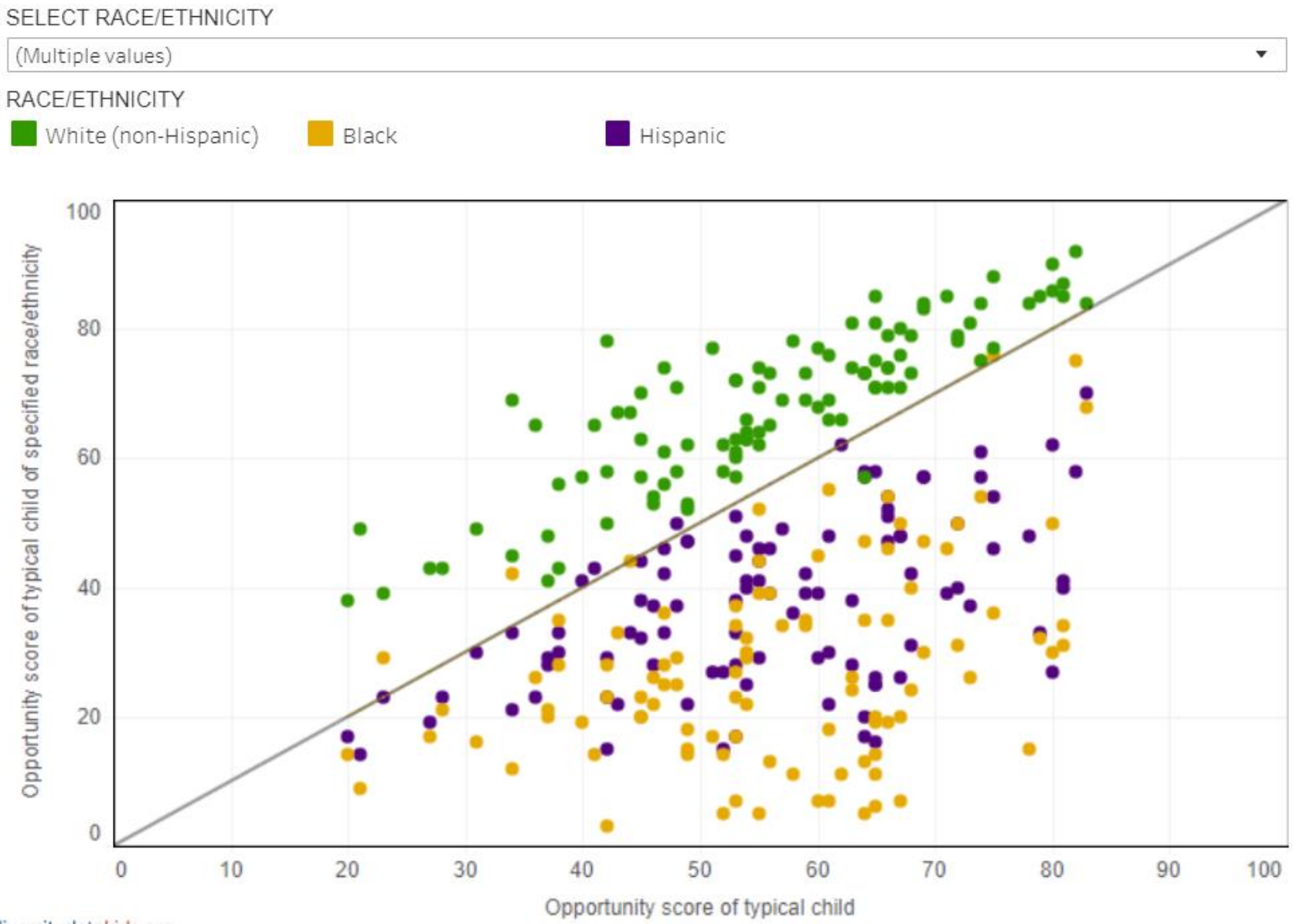
In nearly all metros, the typical white child lives in a neighborhood with a higher Child Opportunity Score than the overall score



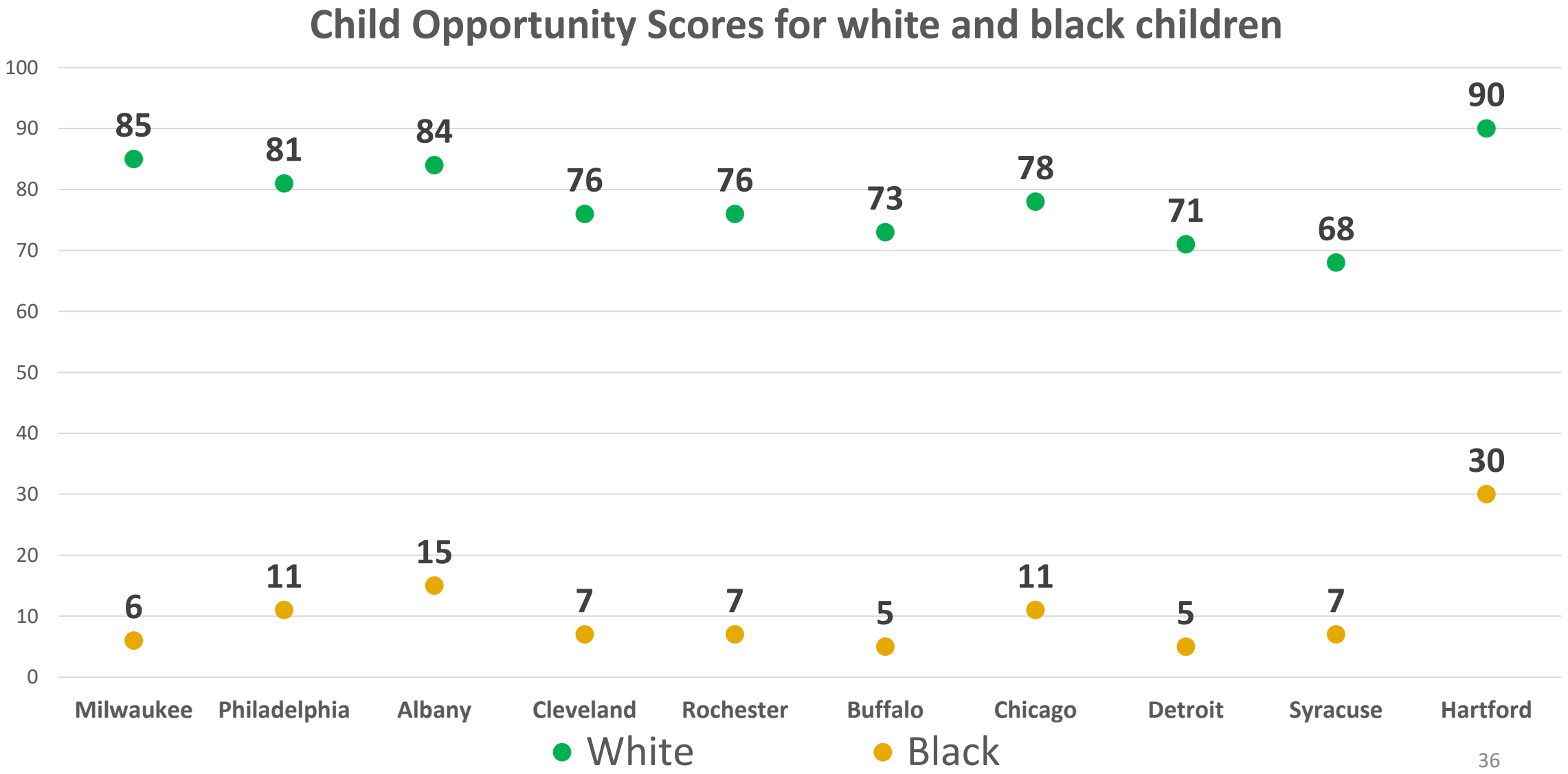
In nearly all metros, the typical black child lives in a neighborhood with a lower Child Opportunity Score than the overall score



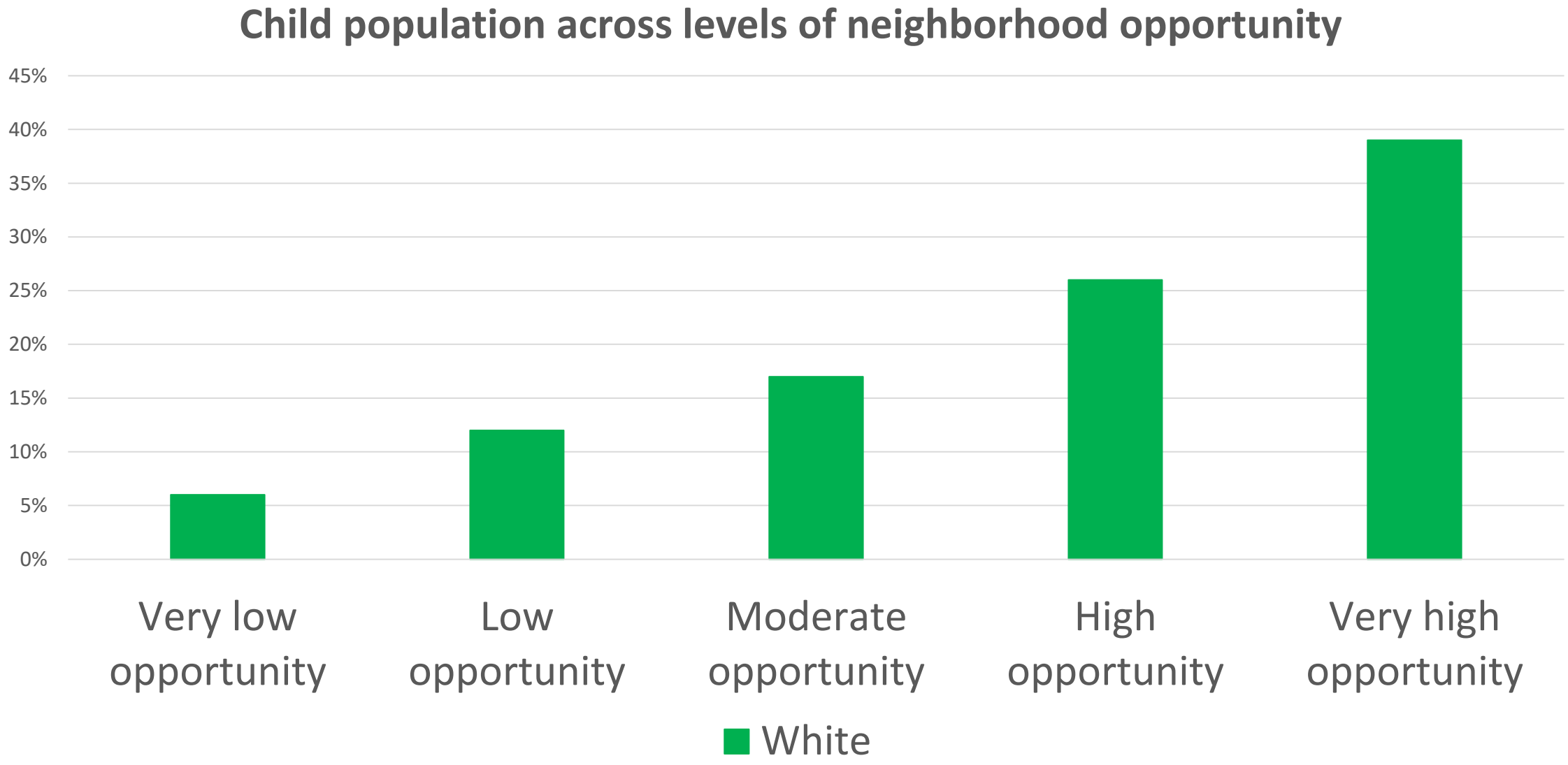
In nearly all metros, the typical Hispanic child lives in a neighborhood with a lower Child Opportunity Score than the overall average score



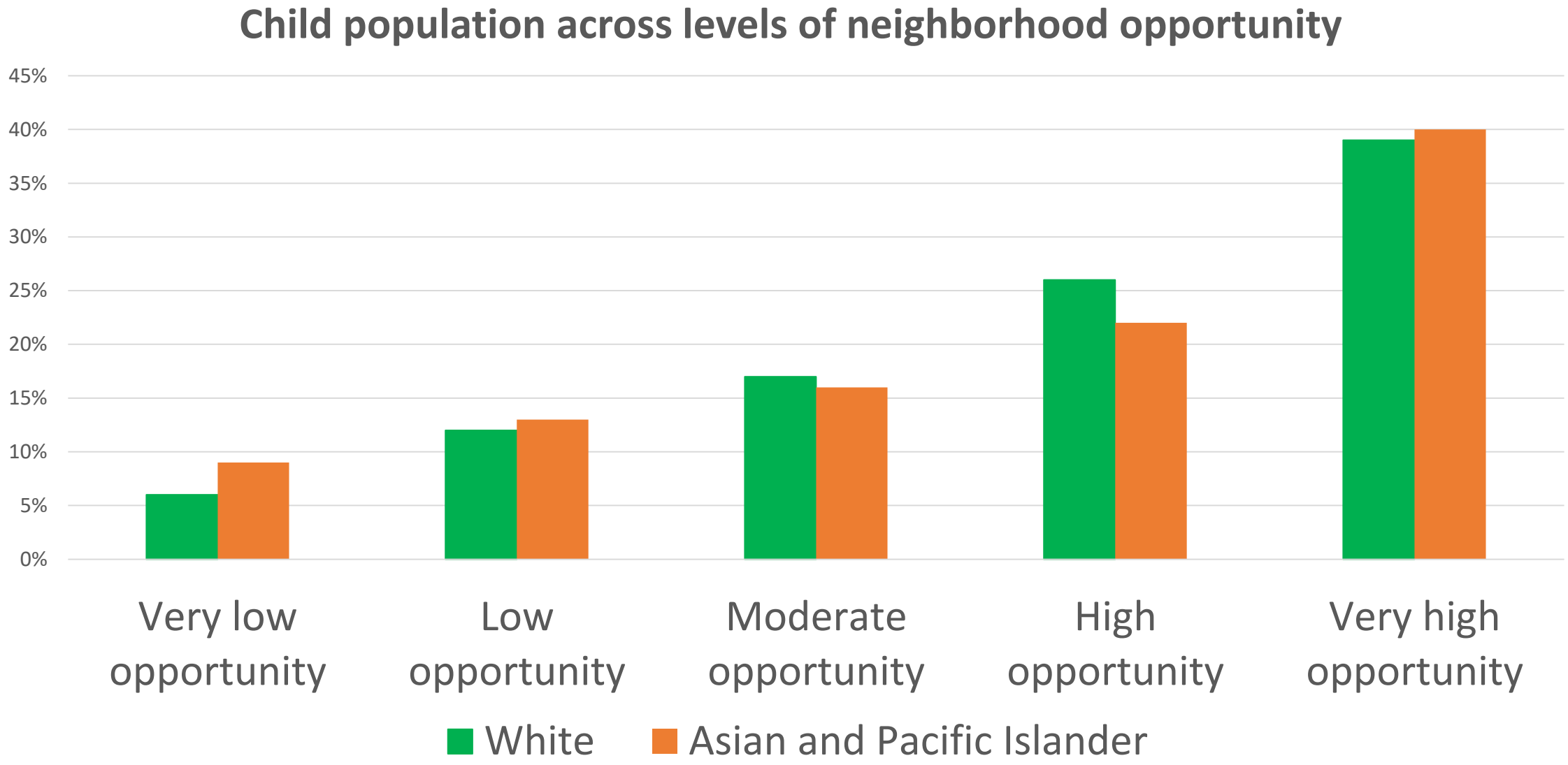
Ten metros with widest Child Opportunity Gap between white and black children



The majority of white children live in High- (26%) or very high- (39%) opportunity neighborhoods

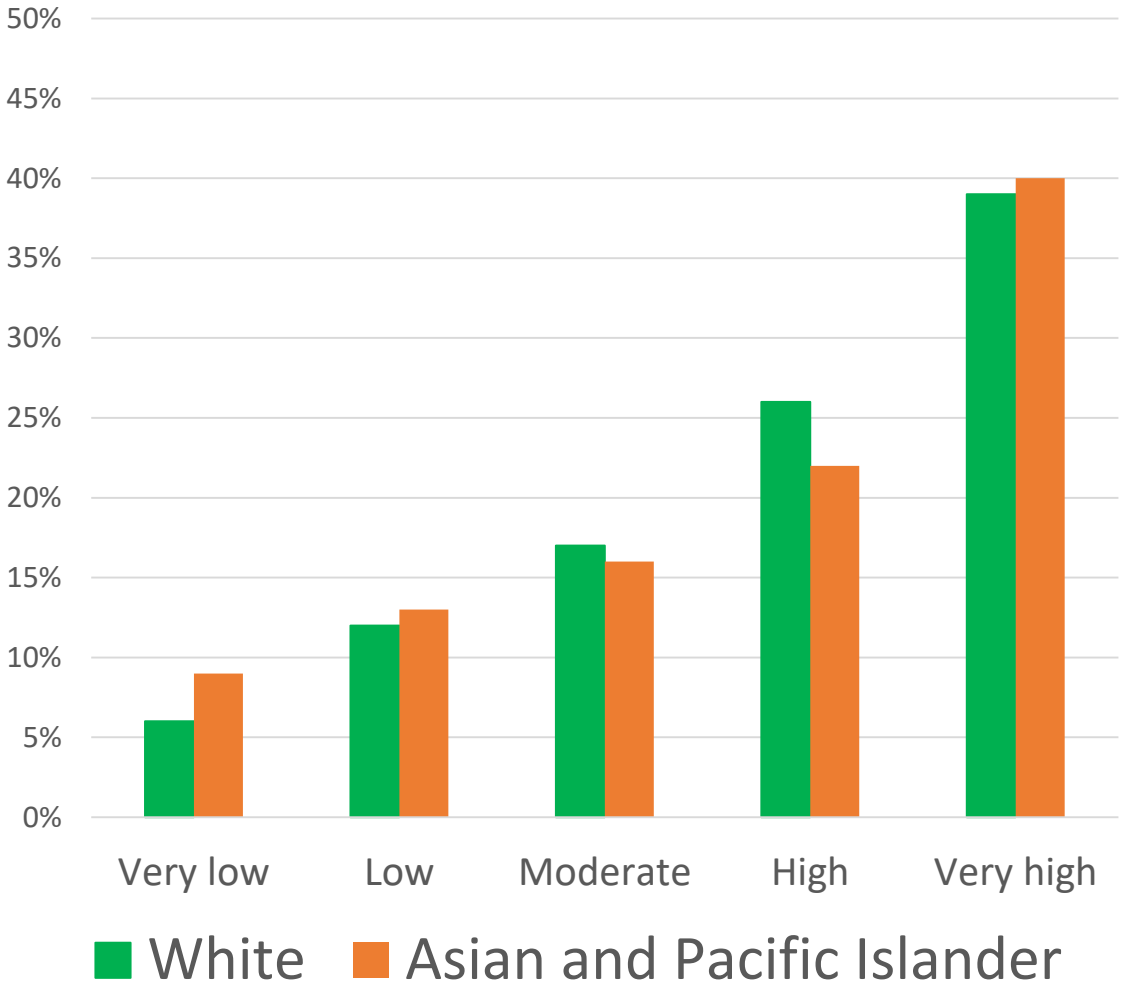


The majority of Asian and Pacific Islander children live in High- (22%) or very high- (40%) opportunity neighborhoods

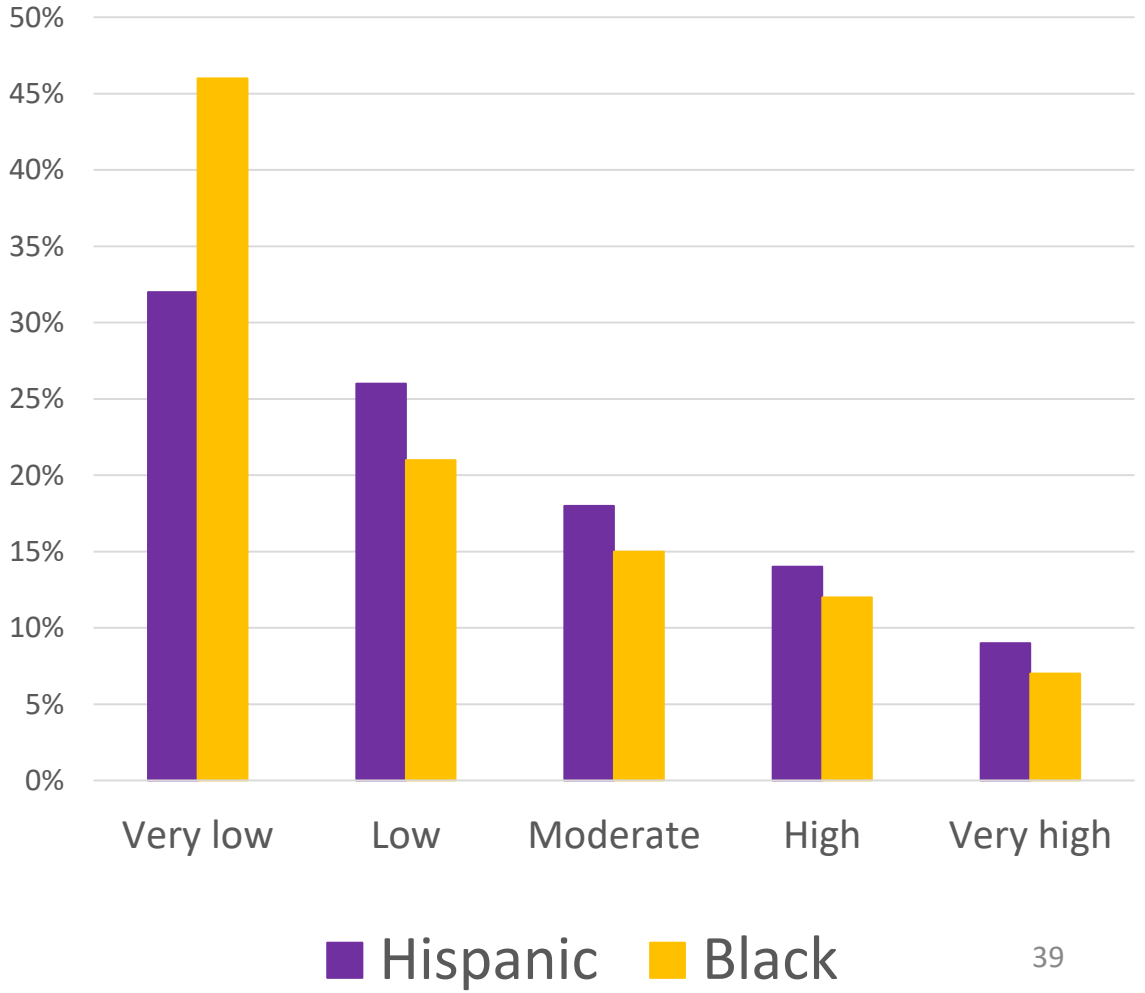


The majority of black and Hispanic children live in very low- or low-opportunity neighborhoods

Child population across levels of neighborhood opportunity



Child population across levels of neighborhood opportunity



In the 100 largest metros, 9.8 million children live in very low-opportunity neighborhoods

4.5 million are Hispanic

3.6 million are black

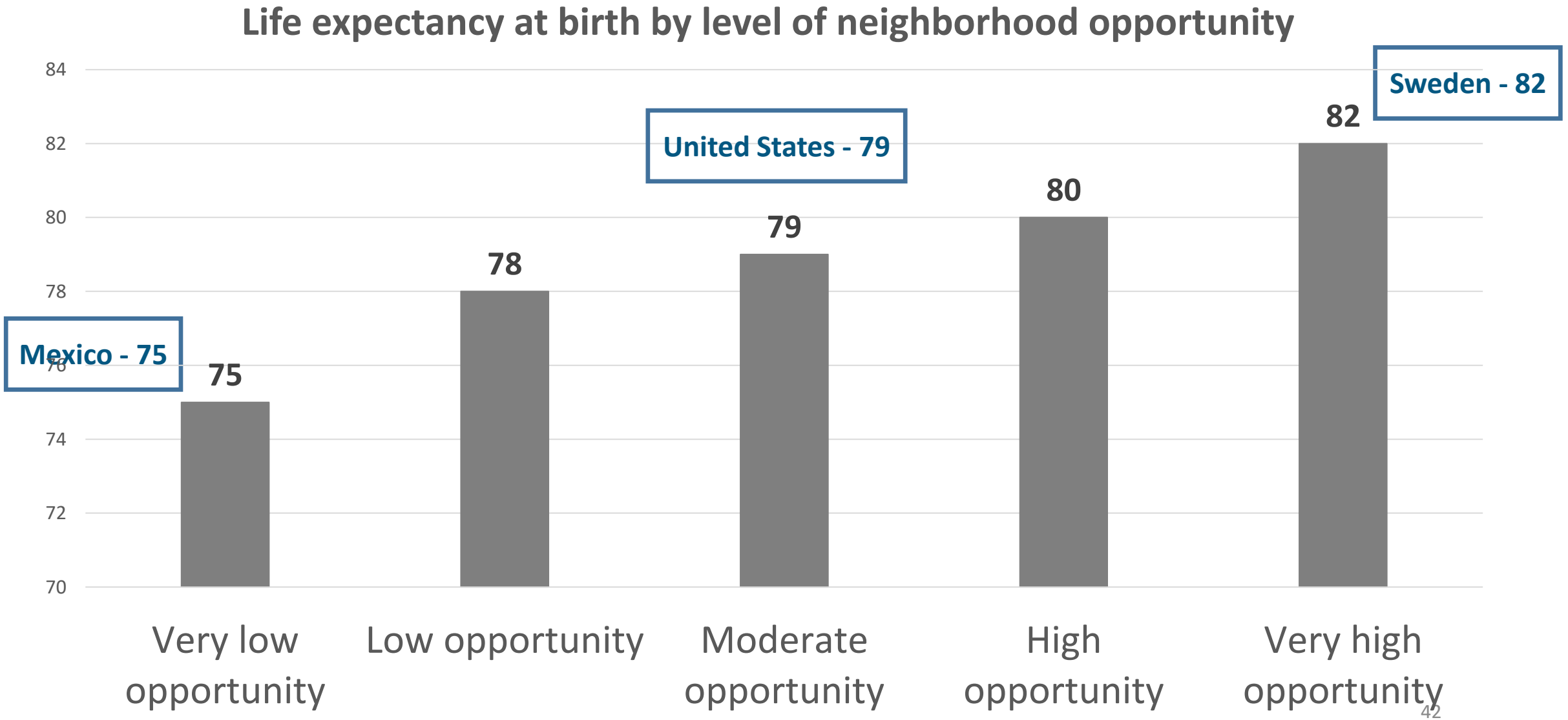
1.2 million are white

280,000 are Asian/Pacific Islander

Measures of child opportunity should be predictive of how well children will do in the future.

The Child Opportunity Index 2.0 shows a strong association with life expectancy and socioeconomic mobility.

There is a difference of seven years in life expectancy between very high and very low opportunity neighborhoods



Strong user demand for the Child Opportunity Index

- Many users of the Child Opportunity Index 1.0—our first index released in 2014—are using the index to advance positive change in their communities.

    - Albany, NY (city government)
    - Pinellas County, FL (county government, Juvenile Welfare Board)
    - Chicago, IL (city government and hospitals)
    - Mobility Works (housing mobility programs across the country)

Some key findings

- Child Opportunity Scores for the 100 largest metros range from 20 in Bakersfield to 83 in Madison,
- Variation in neighborhood opportunity is larger within metros than across the country.
- The difference in conditions between very low- and very high-opportunity neighborhoods (Child Opportunity Gap) varies considerably between metros.
- Some metros have very wide Child Opportunity Gaps (opportunity hoarding); others have much narrower gaps (opportunity sharing)
- The stronger predictors of child neighborhood opportunity are race and ethnicity.
- The Child Opportunity Score for white children is 73 compared to 24 for black children and 33 for Hispanic children.
- Black children are 7.6 times and Hispanic children 5.3 times more likely to live in very low-opportunity neighborhoods than white children.
- Although inequities are pervasive, they are extreme in some metros in the Northeast and Midwest.

Thank you!

Please explore the Child Opportunity Index 2.0 at new.diversitydatakids.org

Website will remain password protected through 1/21

Login credentials:

Username login@ddkpress.org
PW: childopportunity2020

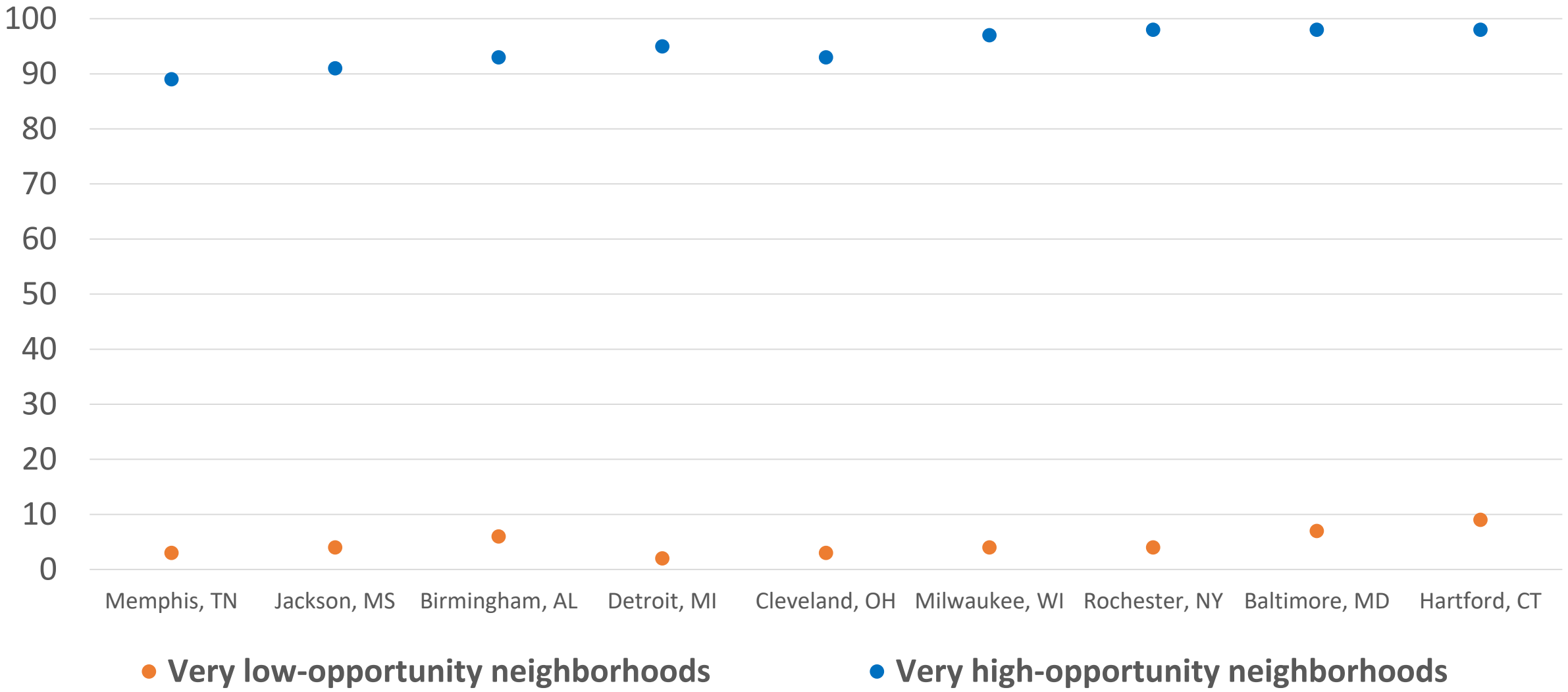
Questions about child opportunity in specific metros that COI 2.0 can answer

Questions	Measures and data
How is overall neighborhood opportunity in a metro and how does it compare to the rest of the country?	Child Opportunity Scores
Which and where are the neighborhoods with the highest and lowest levels of child opportunity?	Child opportunity maps
How different are very low-opportunity and very high-opportunity neighborhoods?	Child Opportunity Gap
Do all children enjoy access to higher opportunity neighborhoods or are there racial/ethnic inequities?	Child Opportunity Scores Distribution of children across opportunity levels by race/ethnicity
How do specific neighborhoods look like in terms of the indicators in COI 2.0? (vignettes)	COI indicators for specific neighborhoods; can use to develop rich descriptions (upon request)

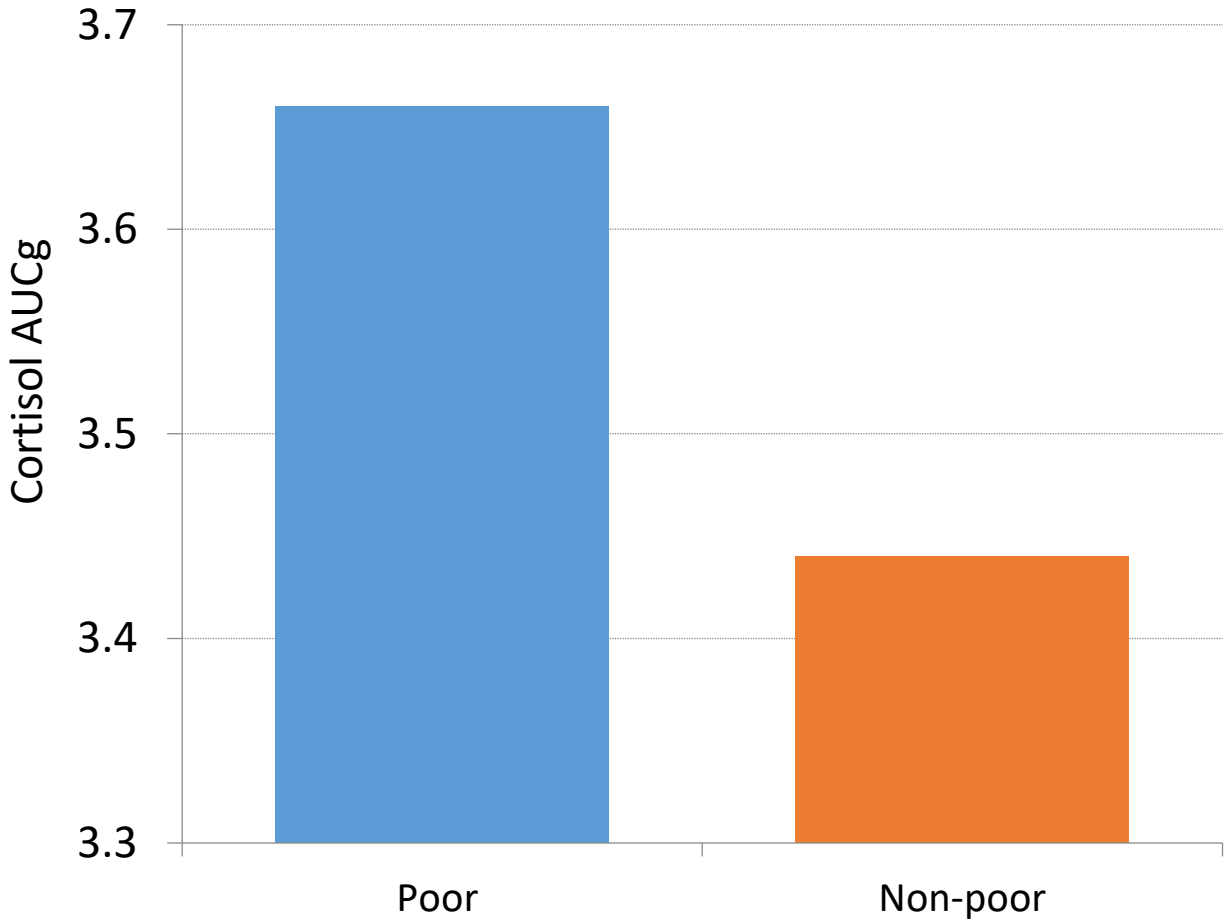
Questions about child opportunity across the country that COI 2.0 can answer

Questions	Measures and data
Which metro areas/regions have the lowest/highest levels of child opportunity?	Child Opportunity Score
Which are the metros with the widest/narrowest gap between very low-opportunity and very high-opportunity neighborhoods? - Opportunity hoarding - Opportunity sharing	Child Opportunity Gap
Which are the metros with the widest/narrowest racial and ethnic gaps in child opportunity?	Child Opportunity Scores by race and ethnicity
Which are the metros with the highest and lowest concentrations of children of different racial/ethnic groups in a given opportunity level?	Distribution of children across opportunity levels by race/ethnicity

Opportunity gap in selected metros
Opportunity hoarding

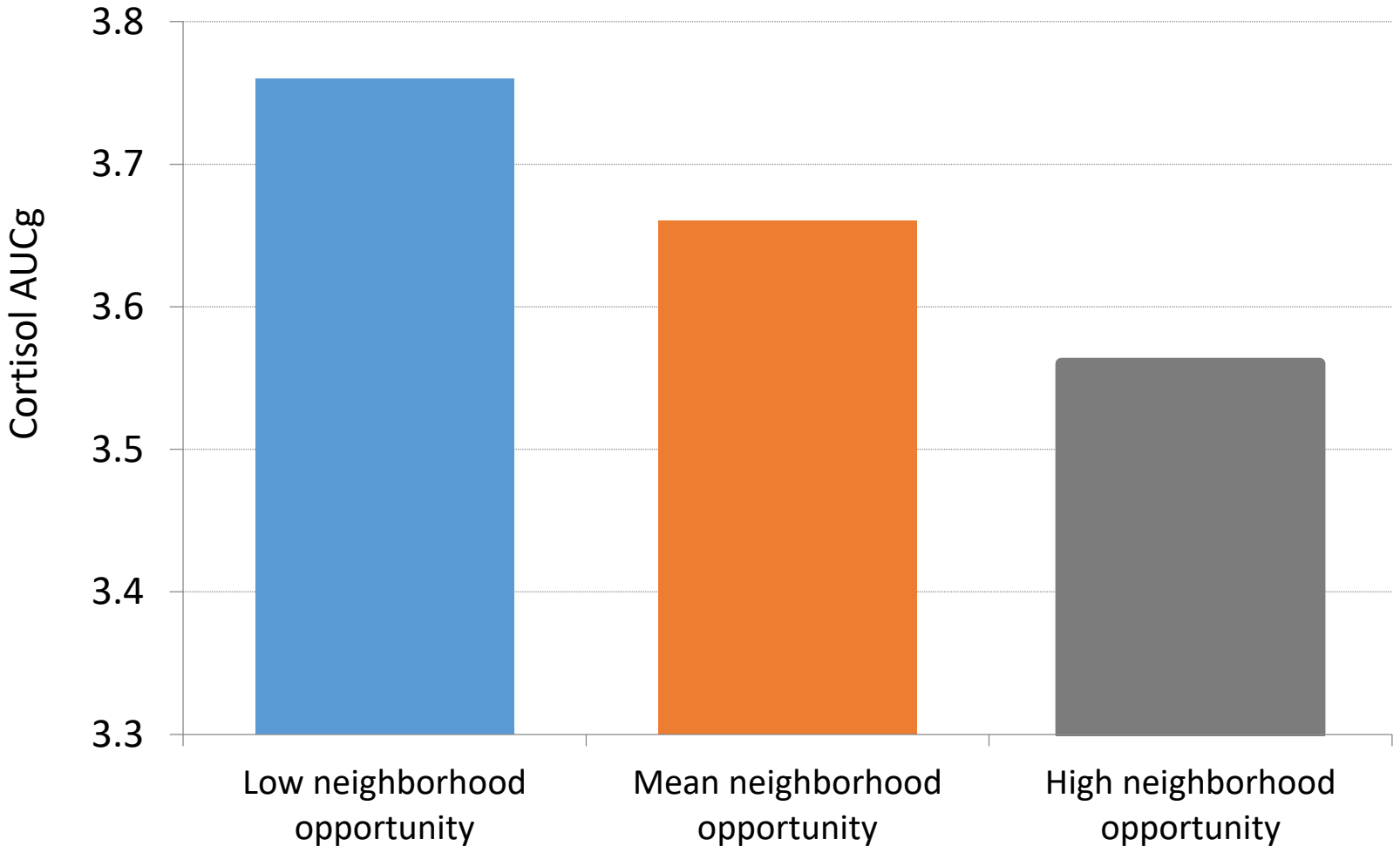


Children in poor families have higher stress levels than those in non-poor families



Roubinov, D.S., Hagan, M. J., Boyce, W. T., Adler, N. E., & Bush, N. R. (2018). Family Socioeconomic Status, Cortisol, and Physical Health in Early Childhood: The Role of Advantageous Neighborhood Characteristics. Psychosomatic Medicine, 80(5), 492-501.

Children in poor families living in high opportunity neighborhoods have lower stress levels



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Building the Index

- Indicators standardized using 2010 means and standard deviations
- Combined into domain and aggregate scores using weights
- Released as nationally normed and metro-normed index
    - Nationally normed: Compare neighborhoods nation-wide
    - Metro normed: Focus on inequalities within a metro area (2015 metro area definitions)

Outcomes for Constructing Weights

Socio-economic outcomes from Opportunity Atlas (Chetty et al.)

- Mean household income rank in adulthood (parents at median of parent income distribution)
- Probability of living in a low poverty census tract in adulthood (parents at median of parent income distribution)

Summary health outcomes from 500 Cities Project (CDC, RWJF)

- Mental health not good for 14 or more days among adults
- Physical health not good for 14 or more days among adults

Hybrid Weights

Unity weights: Each indicator is equally important

Empirical weights a function of how well indicators predict outcomes

- Need: Average causal effect for all indicators
- Have: Bivariate correlation between every indicator and tract-level SES and health outcomes in representative/recent data

Hybrid weights: Average of empirical and unity weights

- Shrinks large weights and inflates small empirical weights
- Guards against bias in empirical weight estimates

Hybrid Weights

Calculate hybrid weight for indicator j as $w_j = (rho_j + 1) / 2$

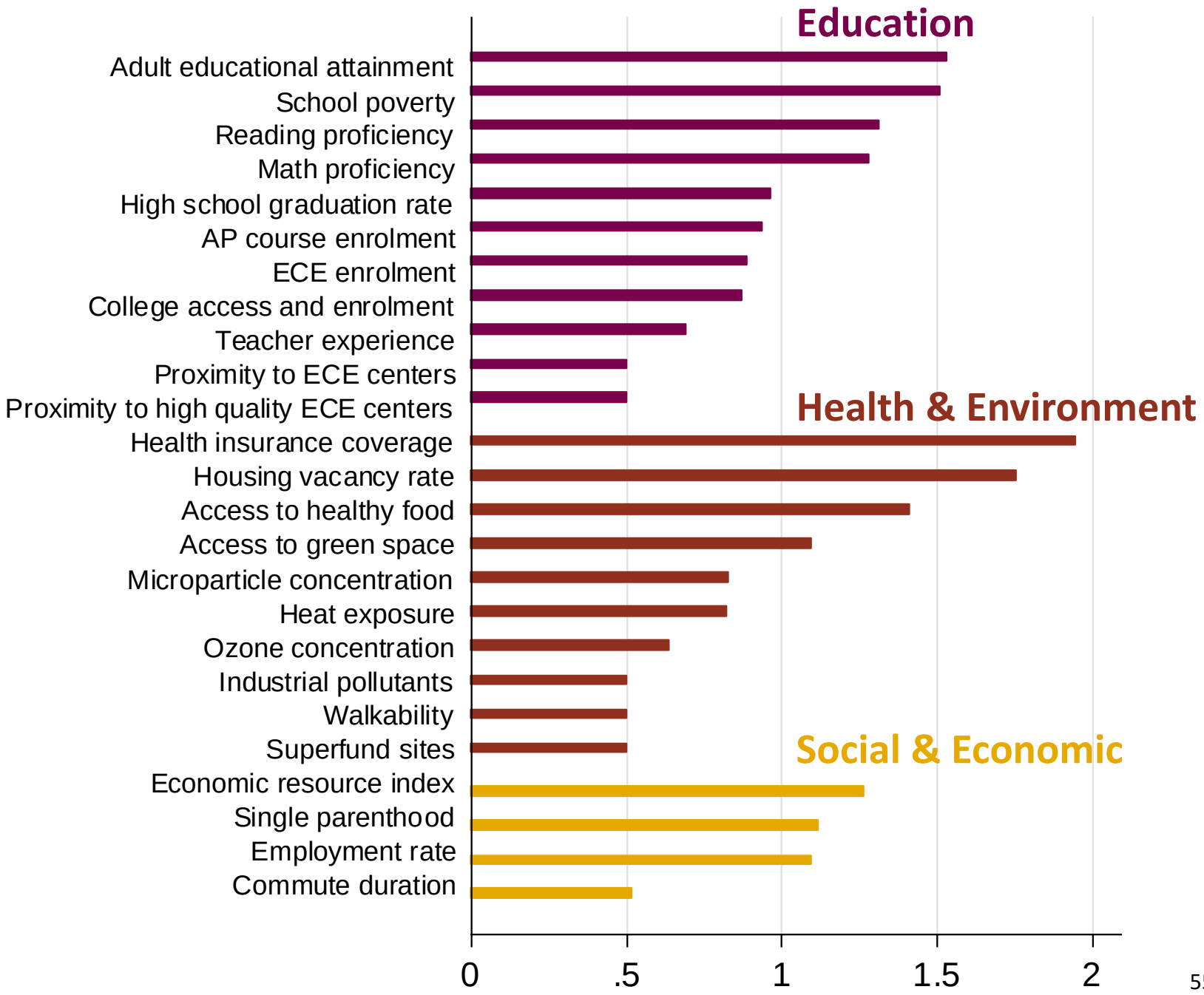
- Calculate bivariate correlation (Pearson's rho) with each of the four outcomes and all **2010** indicator z-scores
- Average rhos for each indicator j across outcomes
- Rescale averaged rhos within domains so that their sum equals the number of indicators in the respective domain (= rho_j)

Sensitivity analyses

- Re-estimate correlations with county fixed effects and controlling for economic resources and population density
- Relative magnitudes of hybrid weights within domains quite robust

Indicator weights by domain

Weights are scaled to sum to the number of indicators within each domain.



Child Opportunity Index (COI) vs. Opportunity Atlas

Child Opportunity Index

Composite index based on 30 indicators covering three domains

- Education
- Health and Environment
- Social and Economic

Focus on **contemporary features** of neighborhoods linked to healthy child development by previous research

Incorporates info from OA (validity); highly correlated with outcomes

Interventions require current data

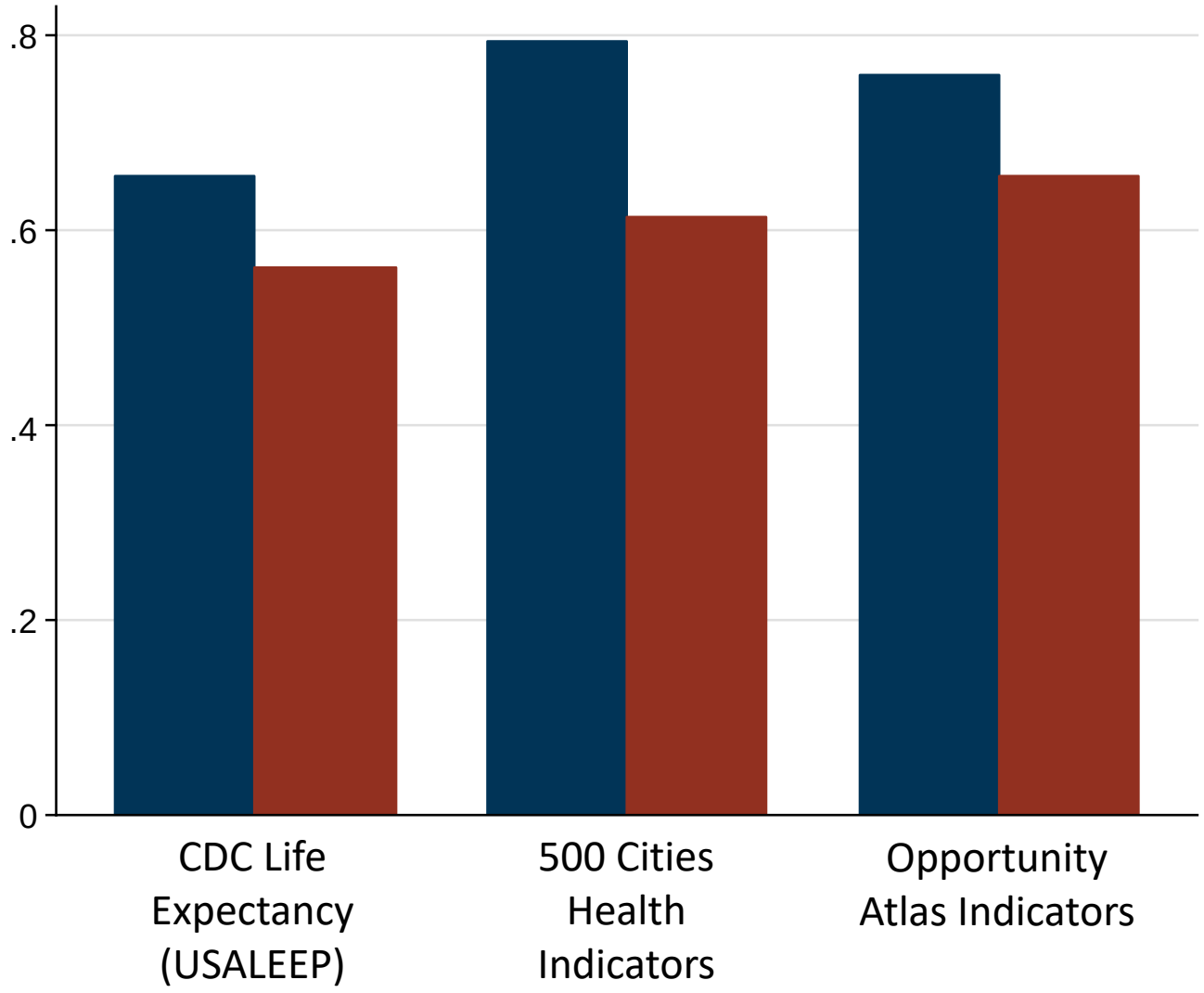
Opportunity Atlas (Chetty et al. 2018)

Estimates of long-term effects of growing up in different neighborhoods on

- Household income rank
- Marital status
- Incarceration

Effects of neighborhoods as they were 15-20 years ago

No information about features of neighborhoods generating these effects



COI 2.0

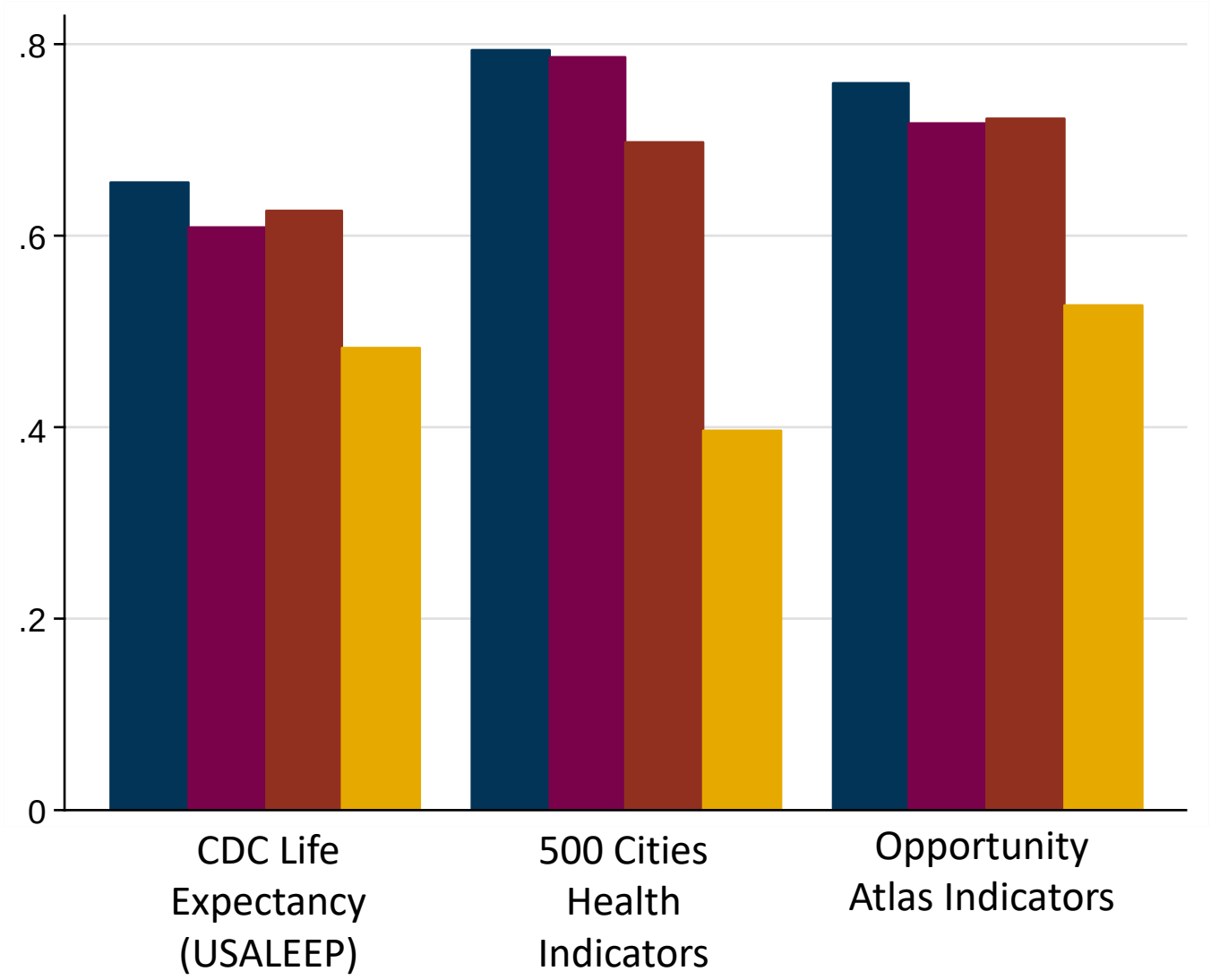
COI 1.0

2015 Massachusetts data

Opportunity Atlas Indicators
HH income rank (p25), HH in low poverty neighborhood (p25), in top 20% of HH income distribution (p25, p50)

500 Cities Indicators
Obesity, diabetes, smoking, limited physical activity, asthma

Bivariate Correlations between COI 1.0 and 2.0 and Different Outcomes



Aggregate Index

Social & Economic

Education

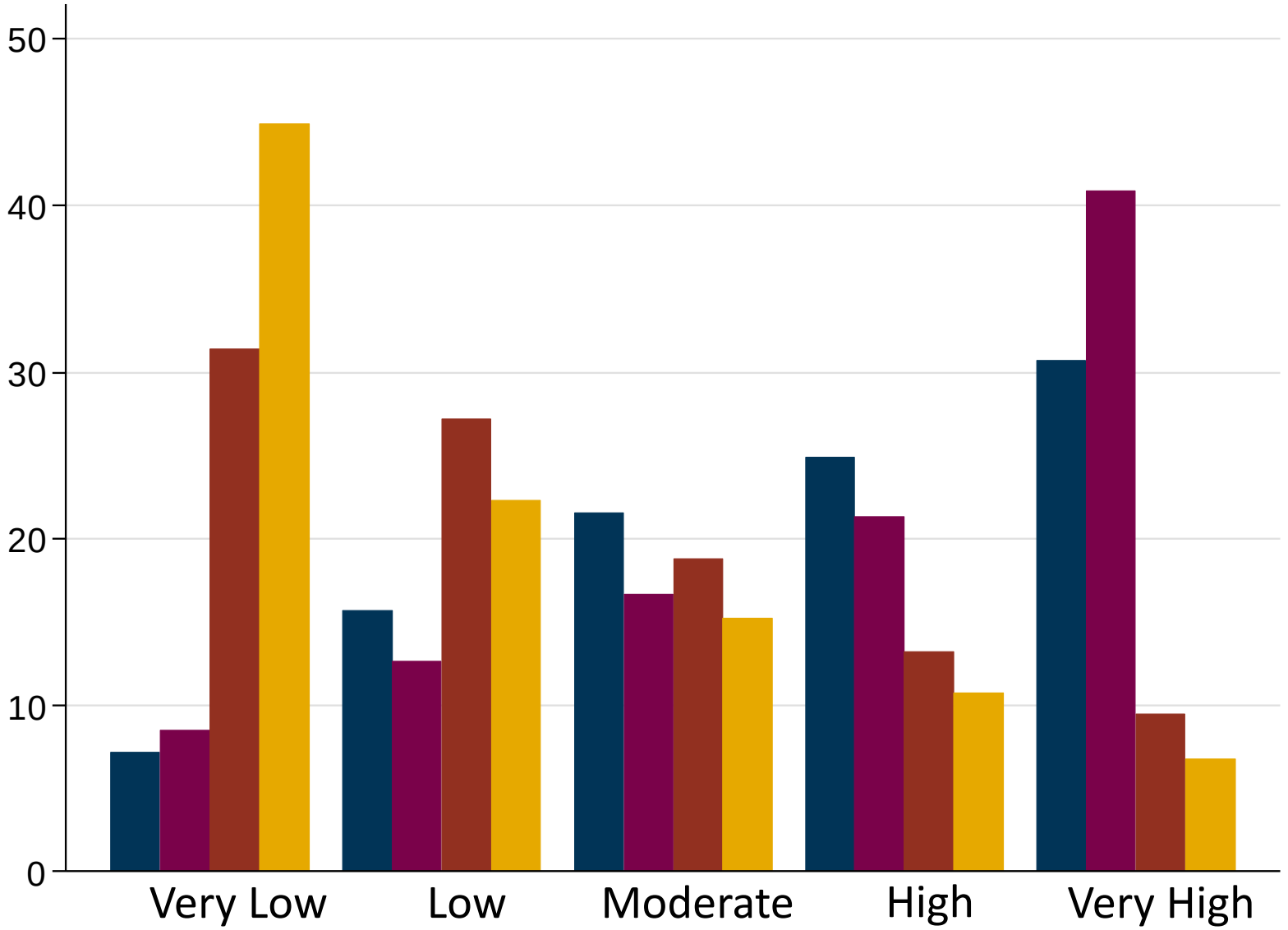
Health & Environment

2015 Massachusetts data

Opportunity Atlas Indicators
HH income rank (p25), HH in low poverty neighborhood (p25), in top 20% of HH income distribution (p25, p50)

500 Cities Indicators
Obesity, diabetes, smoking, limited physical activity, asthma

Bivariate Correlations between COI 2.0 and Different Outcomes



Non-Hispanic White

Asian and Pacific Islander

Hispanic or Latino

Black or African-American

State-normed COI 2.0 for 2015. 2013-17 ACS Population Data, Children aged 0-17.

Percent of Children by Levels of Opportunity, Massachusetts

Summary

Composite index of 29 neighborhood features related to healthy child development

Census tract-level data for 2010 and 2015, comparable across nation-wide and over time

COI 2.0 is highly correlated with long-term socio-economic outcomes, adult health, and life expectancy

Aggregate index more predictive than components

Child Opportunity Index (COI) vs. Opportunity Atlas

Child Opportunity Index

Composite index based on 30 indicators covering three domains

- Education
- Health and Environment
- Social and Economic

Focus on **contemporary features** of neighborhoods linked to healthy child development by previous research

Opportunity Atlas (Chetty et al. 2018)

Estimates of long-term effects of growing up in different neighborhoods on

- Household income rank
- Marital status
- Incarceration

Effects of neighborhoods as they were 15-20 years ago

No information about features of neighborhoods generating these effects