April 10, 2023

Secretary Marcia L. Fudge
Department of Housing and Urban Development
451 7th Street, SW
Washington, DC 20410-0500

Re: Affirmatively Furthering Fair Housing Rule, Docket No. FR-6250-P-01

Dear Secretary Fudge,

We are pleased to submit comments to HUD on the proposed Affirmatively Furthering Fair Housing Rule (the "AFFH Rule" or simply the "Rule" hereafter) published for comment at 88 FR 8516 (February 9, 2023). We submit these comments on behalf of the diversity datakids.org project housed at the Institute for Child, Youth and Family Policy at the Heller School for Social Policy and Management, Brandeis University (please see section on team qualifications at the end of this document).

We commend HUD for building on and improving upon the strengths of the 2015 AFFH Rule while creating a more streamlined process, providing stronger links between fair housing goals and concrete strategies, and introducing more transparency and technical assistance. The proposed Rule also plays an important role in reaffirming HUD's commitment to proactively take meaningful actions to reduce segregation, promote fair housing choice, eliminate disparities in housing-related opportunities, and foster inclusive communities.

We note the first words of the proposed Rule, the "Purpose of the Regulatory Action":

Housing plays a central role in American life. Where children live and grow up is inextricably linked to their level of educational attainment, their relationship with policing and the criminal justice system, what jobs they can obtain as adults, how much wealth their family can attain, whether they will someday purchase their own home, whether they will face chronic health conditions or other lifelong obstacles, and ultimately the opportunities they will be able to provide for their own children and grandchildren.

As experts in the areas of racial/ethnic equity and child health/wellbeing, we applaud this focus on the importance of fair housing for child opportunity. Furthermore, as developers of the Child Opportunity Index (COI), the most comprehensive and accurate index of children's neighborhood opportunity, we believe that the COI is a valuable resource for entities completing their Equity Plans. We propose that HUD specifically recommend the COI for this purpose.

In particular, we propose the use of the **Child Opportunity Index** in response to HUD's following Questions for Comment:

 $^{^{1}}$ diversity datakids.org is funded by the Robert Wood Johnson Foundation and the W.K. Kellogg Foundation.

3b. What additional data and tools could HUD provide to facilitate a regional analysis?

3d. What other data sources should HUD provide for program participants to better identify the various types of inequity experienced by members of protected class groups that are the subject of the proposed rule's required analysis?

3g. Are there additional data sets HUD could provide or require to be used for purposes of conducting a fair housing analysis that relate to eviction, neighborhood features (access to parks, green space, trees), zoning and land use, and housing-related costs (like transportation)?

18. Are there other types of "Community Assets," that should be included in the new definition and the analysis of disparities in access to opportunity for purposes of the Equity Plan? If so, which assets should be included that are not currently included in this proposed rule?

With its focus on community assets and racial/ethnic equity and proven relevance to important fair housing issues, as well as its high-quality validated data, affordability (the COI is currently free to use), ease of use, availability across multiple geographies, and timeliness, the COI is a highly relevant tool that will greatly assist Equity Plan preparers in understanding fair housing issues in their communities and developing plans to address them.

This document is organized as follows:

Section I: Description of the Child Opportunity Index

Section II: The COI is a validated measure of neighborhood opportunity

Section III: The COI enables analysis of inequities in neighborhood opportunity for children by

race/ethnicity, members of protected class groups that are a subject of the proposed

Rule's required analysis

Section IV: The COI is accessible online, free, user-friendly and comes with a high-quality mapping

application

Section V: The COI is available at the census tract and ZIP code levels, and relative neighborhood

opportunity can easily be compared within metropolitan areas, states, and across the U.S., meeting Equity Plan needs for regional analysis at different geographic levels

Section VI: The COI is dynamic; updated with recent, comprehensive data and methods

Section VII: The COI provides unique, new data showing the relationship between child neighborhood

opportunity and historic redlining

Section VIII: The COI is utilized by housing mobility programs throughout the nation. HUD has

highlighted the COI as an "established method" for defining opportunity areas in its

guidance to participants of its Community Choice Demonstration program.

Section IX: The COI has been used by researchers investigating important housing topics, including

the Moving to Opportunity Program (MTO) and the geography of mortgage lending

Section X: The COI is used by a range of local entities in decision making related to health, education,

and resource allocation

Section XI: The COI has been cited in Congressional testimony related to Fair Housing Accountability

Section XII: The COI has been integrated into federal data dashboards Section XIII: Qualifications of the team submitting these comments

Section I: Description of the Child Opportunity Index

The neighborhoods where children live, grow, and learn have important impacts on their current health and wellbeing (Acevedo-Garcia, Noelke, McArdle, et al., 2020), expectations (Galster, 2012), and future success (Chetty, Hendren, & Katz, 2016). Neighborhoods are characterized by both community assets (e.g. high-quality schools, availability of healthy food, green spaces) and stressors (e.g. toxic environments, concentrated poverty schools) which can either reinforce or mitigate the supports or deficits of a child's family environment and a child's own individual characteristics. While research on neighborhoods has historically focused on a single measure, such as poverty, more recent work has advanced to use more complex aggregate indices that capture a range of neighborhood stressors and assets. These measures incorporate an understanding that the effects of neighborhood stressors on child wellbeing can be cumulative, as when high poverty neighborhoods also have high levels of violent crime, but can also potentially be offset by other positive neighborhood factors (Theall, Drury, & Shirtcliff, 2012; Wei, McCoy, Busby, Hanno, & Sabol, 2021).

The <u>Child Opportunity Index 2.0</u> (COI), developed by diversitydatakids.org, is the first single, consistent metric of contemporary child neighborhood opportunity. The COI combines 29 separate component indicators important for child wellbeing (Table 1) in three overall domains—Education, Health and Environment, and Social and Economic—into a composite opportunity index score, which positions/ranks each neighborhood relative to all other neighborhoods in its metropolitan area, its state, and the nation. Each of the individual indicators was vetted for relevance to child development based on empirical literature on neighborhood effects and/or conceptual frameworks of neighborhood influences on children (Acevedo-Garcia, Noelke, & McArdle, 2020). The COI provides complete national coverage, with data for virtually all U.S. neighborhoods (over 72,000 census tracts). In addition to the overall Child Opportunity Index, sub-indices are available for each domain (Education, Health and Environment, and Social and Economic) and for each of the component indicators that comprise the COI, allowing for more focused analysis. Data is currently available for both 2010 and 2015. By early fall 2023, annual data will be available covering the 2012 through 2021 time period. Complete COI documentation is available here (Noelke et al., 2020).

Section II: The COI is a validated measure of neighborhood opportunity

While there are now several publicly available, aggregate indices of neighborhood characteristics, a recent evaluation comparing commonly used neighborhood indices recommends the COI's use in policy and decision making. This evaluation finds that the COI performed consistently overall in terms of its relationship to 24 diverse life outcomes related to mortality, physical health, mental health, subjective well-being, and social capital (Lou, Giorgi, Liu, Eichstaedt, & Curtis, 2023).

Table 1: Component indicators of the Child Opportunity Index

Adult educational attainment

Education Health and Environment Social and Economic Early childhood education **Healthy environments Economic opportunities** Access to healthy food **Employment rate** ECE centers within five miles Commute duration Access to green space High quality ECE centers within Walkability five miles **Economic resource index** Housing vacancy rates **ECE** enrollment Poverty rate, public assistance **Toxic exposures** rate, high skill employment, Primary school median household income, Third grade reading proficiency Superfund sites Third grade math proficiency Industrial pollutants home ownership Microparticles Secondary and post-Family structure Ozone secondary Single parenthood Heat High school graduation rates AP enrollment Health care access College access/enrollment Health insurance coverage Resources School poverty Teacher experience

A growing number of peer-reviewed studies have also found significant associations between the Child Opportunity Index and a range of child health outcomes. Growing up in a neighborhood with higher opportunity is associated with lower child and caregiver mortality (Slopen et al., 2023), longer life expectancy at birth (Shanahan et al., 2022), and better cardiometabolic health (Aris et al., 2021) and may protect children from poor families from the physiological impacts of stress (Roubinov, Hagan, Boyce, Adler, & Bush, 2018). Lower neighborhood opportunity has been linked to increased emergency department visits, hospitalizations, longer hospital stays and hospital readmissions (Bettenhausen et al., 2021; Fritz et al., 2022; Kersten et al., 2018), especially for conditions that could have been treated in or prevented through a primary care setting (Beck, 2017; Kaiser et al., 2022; Krager et al., 2021; Ramgopal, Jaeger, Cercone, Martin-Gill, & Fishe, 2022). Others have shown that children from lower opportunity areas have delayed access to care in the case of an acute emergency, such as appendicitis, which can increase the risk of complications (Bouchard et al., 2022).

A bibliography of research using the COI is attached at the end of this comment.

Section III: The COI enables analysis of the inequities in neighborhood opportunity for children by race/ethnicity, members of protected class groups that are a subject of the proposed Rule's required analysis

The Child Opportunity Index, along with accompanying data on the residential location of children by race/ethnicity, provides a unique and valuable resource addressing HUD's question:

3d. What other data sources should HUD provide for program participants to better identify the various types of inequity experienced by members of protected class groups that are the subject of the proposed rule's required analysis?

In particular, the COI allows Equity Plan preparers to directly observe the relationships between the location of community assets and racial/ethnic segregation, addressing this focus of the Proposed Rule:

The concept of community assets, embedded as a critical focus in the Equity Plan framework used by the rule, acknowledges that residential segregation did not simply act to produce racially homogenous neighborhoods. Rather, segregation also acted to deprive people of color of access to high-quality features that enhance equality of opportunity and quality of life. Disparities in access to community assets overlap significantly with enduring patterns of residential segregation. By directly requiring that program participants consider community assets in their fair housing planning, this rule will prompt greater access for underserved populations to, among other features, environmentally healthy neighborhoods, grocery stores, employment opportunities that pay a living wage, and reliable transportation services. (p. 134)

The COI allows for analysis of racial/ethnic exposure to opportunity in three ways: 1) downloadable census tract-level and ZIP code-level data of COI scores and five opportunity levels (very low- to very high-opportunity), along with child population counts by race/ethnicity; 2) interactive maps that overlay the residential location of children by race/ethnicity on top of opportunity maps; and 3) bar charts which summarize the percent of children by race/ethnicity living in neighborhoods by opportunity level.

Downloadable data from diversitydatakids.org includes population counts for children by race/ethnicity for 2010 and 2015 that can be combined with Child Opportunity Index scores or levels to examine racial/ethnic inequities in child exposure to neighborhood opportunity. Data are available for the following racial/ethnic groups: White (non-Hispanic), Hispanic, Black, Asian/Pacific Islander, American Indian/Alaska Native.

The COI mapping application, discussed below, allows users to overlay the location of the child population by race/ethnicity on top of COI maps and also produce summary bar charts to visually illustrate racial/ethnic inequities in child exposure to neighborhood opportunity. Maps and charts are available for both 2010 and 2015 data, showing the overall COI index or any of the three opportunity domains (Education, Health and Environment, and Social and Economic).

For example, Figure 1a shows a Child Opportunity Index map of the Detroit metropolitan area, with very low-opportunity neighborhoods (census tracts) shaded in light blue and very high-opportunity neighborhoods in dark blue. Figure 1b overlays that map with the location of the Black child population, which is concentrated heavily in the very low-opportunity neighborhoods of the City of Detroit. Figure 1c overlays the location of the White child population, which is concentrated heavily in the higher opportunity neighborhoods of the suburbs.

Figure 2 presents a summary bar chart, available in the COI mapping application, which shows the percent of the Black and White child populations in metro Detroit living in neighborhoods at the five

different opportunity levels (very low- to very high-opportunity). In this case, the chart shows that 59 percent of Black children in metro Detroit live in very low-opportunity neighborhoods, while only 4 percent of White children live in very low-opportunity neighborhoods.

Through census tract level downloadable data, maps and summary bar charts, the COI provides several alternatives for exploring racial/ethnic differences in neighborhood opportunity, allowing Equity Plan producers to easily address one aspect of the proposed Rule's required analysis.

Figure 1a: Child Opportunity Index of Metro Detroit

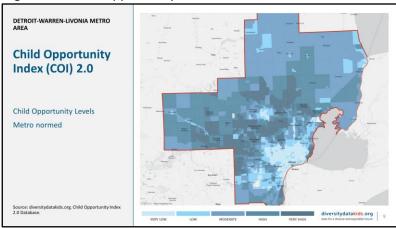


Figure 1b: Overlay of Black child population

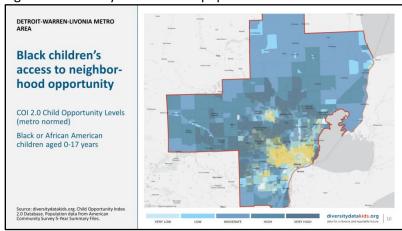


Figure 1c: Overlay of White child population

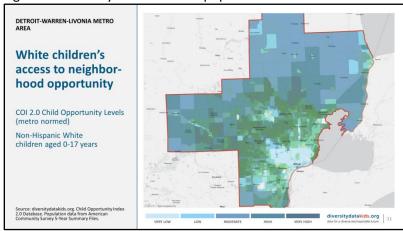
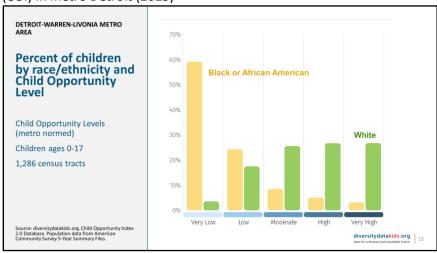


Figure 2: Bar chart showing distribution of Black and White children across neighborhood opportunity (COI) in metro Detroit (2015)



Section IV: The COI is accessible online, free, user-friendly and comes with a high-quality mapping application

The proposed Rule intends that Equity Plan preparation be simpler, less burdensome, and more straightforward than the former AFH requirements under the 2015 Rule. The COI is a valuable tool in achieving this goal. Its <u>downloadable data</u> and <u>mapping application</u> are both easily accessible online and are free to all users. The mapping application contains extensive FAQs, and a <u>webinar</u> describes the COI and how it can be used. A <u>central dashboard</u> contains links to the data, maps, methodology, glossary of terms, report, webinar, and visualizations, as well as impact stories of how organizations across the U.S. have used the COI to advance equity.

Section V: The COI is available at the census tract and ZIP code levels, and relative neighborhood opportunity can easily be compared within metropolitan areas, states, and across the U.S., meeting Equity Plan needs for regional analysis at different geographic levels

The entities required to submit Equity Plans vary in their "expected geographic areas of analysis." The COI provides data and analysis at several levels of geography, allowing diverse entities to meet their obligation. The COI's primary geography is the census tract, the unit most commonly used as a proxy for neighborhoods. However, the COI also includes data at the ZIP code level, fully incorporated into the mapping application, along with racial/ethnic child population overlays to examine the relationships between opportunity and segregation. Each ZIP code also includes an indicator specifying the amount of variability in opportunity across neighborhoods within that ZIP code. Further, COI data at the county level is available upon request.

In addition to presenting data at different geographic levels, the COI also allows users to compare opportunity between census tracts or ZIP codes to other tracts or ZIPs 1) within the same metropolitan area, 2) within the same state, or 3) across the U.S. as a whole. In other words, users can examine the *relative* opportunity of a neighborhood within a metro area or state, and not just in comparison to all neighborhoods nationwide. Changing the relative comparison geography is a simple, one click procedure in the mapping application.

Section VI: The COI is dynamic; updated with recent comprehensive data and methods

Currently, the COI data reflects two time periods, 2010 and 2015. However, in early fall 2023, COI 3.0 will be released, presenting annual data from 2012 to 2021. Future data will be updated bi-annually.

COI 3.0 measures will also be updated and enhanced. For example, new measures will capture the organizational richness and social capital of neighborhoods, including community organizations, which are causally-linked to reductions in crime. A measure of housing quality and more reliable measures of access to healthy environments and green space will be added. Technical updates in weighting and index construction will further enhance the predictive validity of COI 3.0.

Section VII: The COI provides unique, new data showing the relationship between child neighborhood opportunity and historic redlining

In the proposed Rule, HUD correctly identifies the destructive influences that some governmental policies have had in producing separate and unequal neighborhoods:

Notwithstanding progress in combatting some types of housing discrimination, the systemic and pervasive residential segregation that was historically sanctioned (and even worsened) by Federal, State, and local law, and that the Fair Housing Act was meant to remedy has persisted to this day. In countless communities throughout the United States, people of different races still reside separate and apart from each other in different neighborhoods, often due to past government policies and decisions (p. 5)

Historical redlining, in which mortgage credit was withheld from communities deemed "high risk,"— often because of the presence of Black, lower class, or immigrant residents—is one example of past discrimination for which researchers have been able to establish continuing negative effects. Research has shown causal effects of redlining on neighborhood conditions years later, including: homeownership, home values and racial residential segregation (Aaronson, Faber, Hartley, Mazumder, & Sharkey, 2021; Aaronson, Hartley, & Mazumder, 2021; Faber, 2020) and intergenerational economic mobility (Aaronson, Faber, et al., 2021). Redlining has also been associated with present-day firearm assaults and violent crimes (Jacoby, Dong, Beard, Wiebe, & Morrison, 2018), preterm birth and other birth outcomes (Krieger et al., 2020; Nardone et al., 2020), self-rated health (McClure et al., 2019), asthma-related emergency department visits (Nardone et al., 2020), and lack of greenspace (Nardone, Rudolph, Morello-Frosch, & Casey, 2021).

While establishing causality between historical redlining and present-day conditions is methodologically challenging, it can be useful for communities to see the geographic patterns of historical redlining in their area, as well as its associations with present day neighborhood opportunity and racial/ethnic residential patterns. Until very recently, visualizing these relationships has been difficult, because the neighborhood geographies existing at the time of redlining do not coincide with spatial geographies used today for data reporting and presentation.

In the past year, diversitydatakids.org has developed a <u>novel method</u> of classifying present-day census tracts according to their 1930s Home Owner Loan Corporation (HOLC) grades—the risk grades shown on redlining maps. We have published <u>these new data</u> for both 2010 and 2020 census tracts. Like the COI, they are freely available for download on our website. In areas that were graded by HOLC and for which risk grade and boundary information are available, our data describe the proportion of each census tract's geographic area that was covered by original A, B, C, and D (best to worst) HOLC ratings. Because many of today's neighborhoods contain more than one geographic area that received different HOLC rankings, these data also provide newly developed classifications that synthesize multiple grades within the same tract into parsimonious and predictively optimal classifications—for example, "Mainly A" or "Mainly B, some A."

More research on the long-term effects of redlining and similarly racist housing policies and practices is needed to unpack and redress the insidious effects of structural racism and the damage it has inflicted on Black, Hispanic and immigrant neighborhoods and populations. Such efforts can support public engagement processes and policies that illuminate and combat structural racism, including those proposed in AFFH Equity Plans. We hope that the publication of our data, building on the original HOLC maps digitalized by the <u>Digital Scholarship Lab</u>, will facilitate these efforts.

Section VIII: The COI is utilized by housing mobility programs throughout the nation

In its guidance to participants of the Community Choice Demonstration program (U.S. Department of Housing and Urban Development, 2022a) and for mobility programs overall (U.S. Department of Housing and Urban Development, 2022b), HUD has highlighted the COI as an "established method" for defining opportunity areas. The COI is currently used to define opportunity areas for the MA Department of

Housing and Community Development's <u>Supporting Neighborhood Opportunity housing mobility program</u> (SNO Mass). This program, which serves Section 8 voucher holders with a child under the age of 18 in the household, provides support and financial assistance to allow these families to move to higher opportunity areas, as well as to landlords who rent to SNO participants. The COI is a particularly appropriate metric for this population, as it captures a wide range of neighborhood features related to child wellbeing. The COI has also been used in housing mobility programs in Los Angeles, Cleveland, and Buffalo.

Section IX: The COI has been used by researchers investigating important housing topics, including the Moving to Opportunity Program (MTO) and the geography of mortgage lending

Academic and other researchers have used the COI in rigorous analyses of critical housing questions. For example:

Using data from the Moving to Opportunity (MTO) experiment (1994–2010) along with the COI, researchers tested whether MTO improved long-term exposure to neighborhood opportunity overall and across multiple domains—social/economic, educational, and health/environmental—among low-income families with children (Kim, Schmidt, Osypuk, Thyden, & Rehkopf, 2022). They found that MTO voucher recipients experienced improved neighborhood opportunity overall and across domains during the entire study period, when compared with controls in public housing. Furthermore, there was a larger treatment effect for families in the MTO voucher group who received supplementary housing counselling. The authors also used machine-learning tools to examine whether the effects of receiving housing vouchers may vary across subgroups, such as city, households with and without vehicle access, and households with and without health and developmental problems. For example, the researchers found that a family who receives a voucher but lacks to a car may be less likely to experience long-term higher neighborhood opportunity, suggesting that pairing a housing voucher with a car or transportation voucher may maximize the housing voucher's potential.

In <u>Barriers and opportunities in the housing voucher program: The importance of race in the housing search process</u> (Curley, Graves, & Weismann, 2019), published by the Federal Reserve Bank of Boston, researchers compared voucher holders moving to higher-opportunity neighborhoods (as defined by the COI) with those moving to lower-opportunity neighborhoods. They found that, although most voucher holders preferred living in safe, economically diverse neighborhoods, their race, information and search strategies, as well as discrimination by property owners and managers, impacted their housing location outcomes. Black families experienced the greatest access barriers to higher-opportunity communities, even after controlling for search strategies.

Enterprise Community Partners, in A Review of the New York State Housing Mobility Pilot Lessons from Buffalo, Long Island, and New York City (Weismann, 2022), used the COI in evaluating its 2020 housing mobility pilot program in three New York cities. The program connected voucher-holding households who were interested in moving to more well-resourced neighborhoods with critical assistance such as credit and budget counseling programs, search assistance, and financial support. Program participants

reported living in healthier environments, better physical and mental health, better sleep, and less stress, without disruptions to their work life, resources, or social connections.

Forthcoming research from diversitydatakids.org uses the COI to examine racial and ethnic differences in the extent to which mortgage borrowers in their prime childrearing years are likely to purchase homes in neighborhoods with different levels of opportunity. Using 2019 Home Mortgage Disclosure Act data for the 100 largest metropolitan areas, we find that Black mortgage borrowers are almost three times as likely, and Hispanic borrowers two times as likely, as White borrowers to buy in very low-opportunity neighborhoods, controlling for demographic, financial, and metro area characteristics.

Section X: The COI is used by a range of local entities related to health, education, and resource allocation

The COI is used not only for housing policy and research, by also by organizations across a wide range of fields for decision making, policy development, implementation, and resource allocation. For example:

The Chicago Department of Public Health (CDPH) incorporated the COI as the cornerstone indicator of its Healthy Chicago 2.0 plan. Launched by CDPH and the Chicago Mayor's Office, the plan was meant to ensure "a city with strong communities and collaborative stakeholders, where all residents enjoy equitable access to resources, opportunities and environments that maximize their health and well-being." The COI was used in analyzing relationships between neighborhood opportunity and teen birth rates, lead levels, non-fatal shootings, life expectancy, child obesity, and neighborhood child racial/ethnic composition; in goal setting; and as part of a seed grant program aimed at fostering safe, accessible, and welcoming transit stations. Through CDPH's partnerships, COI usage spread throughout the Chicago health landscape. For example, it was incorporated into the Chicago Health Atlas—the premier website for population health data in Chicago—and featured in the Alliance for Health Equity's regional Community Health Needs Assessments (CHNAs) for Chicago and Suburban Cook County.

The <u>Great Start Readiness Program</u> in Michigan, which provides public preschool to more than half of all eligible low-income four-year-old children in Michigan, uses the COI to target services toward children in low-opportunity neighborhoods. Program administrators recognize that these children not only often have insufficient access to high-quality early education, but also may experience a range of adverse conditions that can disrupt early learning.

The City of Akron, Ohio used the COI to understand <u>inequities in the distribution of trees</u> across neighborhoods, finding that neighborhoods with the lowest opportunity also had the sparsest distribution of trees, caused by decades of uneven investment. Trees are critical to health and wellbeing: they protect residents from the harmful effects of excessive heat; help clean the air of pollution, improving health and reducing respiratory illnesses like asthma; and they absorb rainwater runoff and prevent flooding. Trees have even been shown to reduce gun violence and increase residents' feelings of safety, belonging and wellbeing. Using the COI allowed Akron to create a blueprint to focus scarce resources strategically and increase tree equity in the future.

Section XI: The COI has been cited in Congressional testimony to promote Fair Housing Accountability

In a 2020 House Committee on Oversight & Reform hearing titled "The Threat to America's Children: The Trump Administration's Proposal to Gut Fair Housing Accountability, " Rep. Alexandria Ocasio-Cortez cited the Child Opportunity Index and related findings about racial inequities in the distribution of children across the 100 largest U.S. metros. This important testimony addressed the Trump administration proposal to eliminate the Fair Housing Act's focus on segregation.

Section XII: The COI has been integrated into federal data dashboards

The Centers for Disease Control and Prevention (CDC) have incorporated the COI into its National Environmental Public Health Tracking (NEHPT) project database. The project's mission is to compile information on U.S. communities from a nationwide network of integrated health and environmental data sources to drive actions that improve community health. This comprehensive data platform allows child neighborhood opportunity to be visualized alongside other data related to health equity.

Section XIII: Team qualifications

diversitydatakids.org is a project of the Institute for Child, Youth and Family Policy at the Heller School for Social Policy and Management at Brandeis University. diversitydatakids.org monitors children's access to resources that support their wellbeing and evaluates the effectiveness and equitable distribution of social policies. Established in 2014 with support from the W.K. Kellogg Foundation and the Robert Wood Johnson Foundation, diversitydatakids.org set out to fill an urgent need for a rigorous, equity-focused research program with a clear mission to help improve child wellbeing and increase racial and ethnic equity in opportunities for children.

Flagship projects of diversitydatakids.org include the Child Opportunity Index (COI) and the Policy Equity Assessment (PEA). The COI is a data tool that measures, maps, and compares the neighborhood conditions that matter for children's healthy development. The PEA is a framework that uses an equity perspective to assess social policies and programs, particularly those that serve the most vulnerable families and children, and recommends ways to make policies and programs more effective and equitable. diversitydatakids.org has a thriving community of users of its research and data. Our users include federal, state, and local policymakers; health care leaders and practitioners; housing, early childhood, and education specialists and advocates; national and community grantmakers; and child and family equity researchers across the country. diversitydatakids.org provides them with the information they need to make a positive impact through further research, community conversations about equity, and policies to increase equitable access to opportunity for all children.

Our team has decades of expertise on neighborhood and housing effects on child health and wellbeing. We have been members of the MacArthur Foundation Research Network on How Housing Matters for Families and Children (2009-2014) and members of several committees of the National Academies of Sciences, Engineering, and Medicine. We are on the Steering Committee on the Housing and Children's Healthy Development Study funded by the National Institute of Child Health and Human Development, the U.S. Department of Housing and Urban Development, and the MacArthur Foundation. In the past

several years our team members have presented our research on neighborhood opportunity to federal audiences at the Centers for Disease Control and Prevention and the Maternal and Child Health Bureau of the Health Resources and Services Administration. We were among the first research groups to discuss the use of opportunity maps in the operation of the Section 8 voucher program.

Our team has expertise in research on residential and school segregation, as well as significant experience in the fair housing field. We have conducted rigorous quantitative analyses to support housing discrimination and disparate impact cases, participated as members and co-chairs in fair housing advocacy in Boston (Fair Housing Center of Greater Boston; Advisory Committee on the Analysis of Impediments to Fair Housing Choice in Boston (City of Boston, Office of Civil Rights); Advisory Committee to the Boston Metropolitan Area Planning Council's Equity Report Card) and nationally (Social Science Advisory Board of the Poverty and Race Research Action Council).

Our professional activities related to fair housing include invited testimony to the National Commission on Fair Housing and Equal Opportunity led by former HUD Secretaries Cisneros and Kemp, a briefing for the Congressional Black Caucus on housing policy as a tool to tackle health disparities, a convening with HUD Secretary Shaun Donovan on the Section 8 Housing Voucher program, and a presentation at the White House Conference on the Future of Rental Housing Policy.

diversitydatakids.org project team members (contributing to this comment):

Nancy McArdle, MPP
Senior Research Analyst, <u>diversitydatakids.org</u>
Institute for Child, Youth and Family Policy
The Heller School for Social Policy and
Management
Brandeis University

Samuel F. and Rose B. Gingold Professor of Human Development and Social Policy Director, Institute for Child, Youth and Family Policy and diversitydatakids.org The Heller School for Social Policy and Management Brandeis University

Dolores Acevedo-Garcia, PhD, MPA-URP

Pamela Joshi, PhD, MPP
Senior Scientist, The Heller School for Social
Policy and Management
Associate Director, Institute for Child, Youth and
Family Policy
Policy Research Director, diversitydatakids.org
Brandeis University

Clemens Noelke, PhD Scientist, The Heller School for Social Policy and Management Research Director, diversitydatakids.org Brandeis University

References

- Aaronson, D., Faber, J., Hartley, D., Mazumder, B., & Sharkey, P. (2021). The long-run effects of the 1930s HOLC "redlining" maps on place-based measures of economic opportunity and socioeconomic success. *Regional Science and Urban Economics*, 86, 103622.
- Aaronson, D., Hartley, D., & Mazumder, B. (2021). The effects of the 1930s HOLC" redlining" maps. American Economic Journal: Economic Policy, 13(4), 355-392.
- Acevedo-Garcia, D., Noelke, C., & McArdle, N. (2020). The geography of child opportunity: Why neighborhoods matter for equity. Retrieved from Waltham, MA:

 http://new.diversitydatakids.org/sites/default/files/file/ddk the-geography-of-child-opportunity 2020v2.pdf
- Acevedo-Garcia, D., Noelke, C., McArdle, N., Sofer, N., Hardy, E., Weiner, M., . . . Reece, J. (2020). Racial and ethnic inequities in children's neighborhoods: Evidence from the new Child Opportunity Index 2.0. *Health affairs (Project Hope)*, 39(10), 1693-1701. doi:10.1377/hlthaff.2020.00735
- Aris, I. M., Rifas-Shiman, S. L., Jimenez, M. P., Li, L.-J., Hivert, M.-F., Oken, E., & James, P. (2021).

 Neighborhood Child Opportunity Index and adolescent cardiometabolic risk. *Pediatrics (Evanston)*. Retrieved from

 https://pediatrics.aappublications.org/content/early/2021/01/19/peds.2020-018903
- Beck, A. F., Huang, B., Wheeler, K., Lawson, BS., Kahn, R. S., & Riley, C. L. (2017). The Child Opportunity Index and Disparities in Pediatric Asthma Hospitalization across Ohio metropolitan Area, 2011-2013. *The Journal of Pediatrics*, 190, 200-206.e201.
- Bettenhausen, J. L., Noelke, C., Ressler, R. W., Hall, M., Harris, M., Peltz, A., . . . Gay, J. C. (2021). The association of the Childhood Opportunity Index on pediatric readmissions and emergency department revisits. *Academic Pediatrics*. doi:10.1016/j.acap.2021.12.015
- Bouchard, M. E., Kan, K., Tian, Y., Casale, M., Smith, T., De Boer, C., . . . Ghomrawi, H. M. K. (2022). Association between neighborhood-level social determinants of health and access to pediatric appendicitis care. *JAMA network open*, *5*(2), e2148865-e2148865. doi:10.1001/jamanetworkopen.2021.48865
- Chetty, R., Hendren, N., & Katz, L. F. (2016). The effects of exposure to better neighborhoods on children: New evidence from the Moving to Opportunity experiment. *American Economic Review*, 106(4), 855-902.
- Curley, A. M., Graves, E. M., & Weismann, G. (2019). Barriers and opportunities in the housing voucher program: The importance of race in the housing search process. *Community Development Issue Briefs*, 19(3). Retrieved from https://www.bostonfed.org/publications/community-development-issue-briefs/2019/barriers-opportunities-housing-voucher-program.aspx
- Faber, J. W. (2020). We built this: Consequences of new deal era intervention in America's racial geography. *American Sociological Review*, *85*(5), 739-775.
- Fritz, C. Q., Fleegler, E. W., DeSouza, H., Richardson, T., Kaiser, S. V., Sills, M. R., . . . Goyal, M. (2022). Child Opportunity Index and changes in pediatric acute care utilization in the COVID-19 pandemic. *Pediatrics (Evanston)*. doi:10.1542/peds.2021-053706
- Galster, G. (2012). The mechanism(s) of neighbourhood effects: Theory, evidence, and policy implications. In M. van Ham, D. Manley, N. Bailey, L. Simpson, & D. Maclennan (Eds.), Neighbourhood Effects Research: New Perspectives (pp. 23-56). Dordrecht, Netherlands: Springer.

- Jacoby, S. F., Dong, B., Beard, J. H., Wiebe, D. J., & Morrison, C. N. (2018). The enduring impact of historical and structural racism on urban violence in Philadelphia. *Social Science & Medicine*, 199, 87-95.
- Kaiser, S. V., Hall, M., Bettenhausen, J. L., Sills, M. R., Hoffmann, J. A., Noelke, C., . . . Parikh, K. (2022). Neighborhood Child Opportunity and emergency department utilization. *Pediatrics*. doi:10.1542/peds.2021-056098
- Kersten, E. E., Adler, N. E., Gottlieb, L., Jutte, D. P., Robinson, S., Roundfield, K., & LeWinn, K. Z. (2018). Neighborhood Child Opportunity and individual-level pediatric acute care use and diagnoses. *Pediatrics (Evanston)*, 141(5), e20172309. doi:10.1542/peds.2017-2309
- Kim, H., Schmidt, N. M., Osypuk, T. L., Thyden, N., & Rehkopf, D. (2022). Effects of housing vouchers on the long-term exposure to neighbourhood opportunity among low-income families: the Moving to Opportunity experiment. *Housing Studies*, 38(1), 128-151.
- Krager, M., Puls, H., Bettenhausen, J., Hall, M., Noelke, C., Plencner, L., . . . Beck, A. (2021). The Child Opportunity Index 2.0 and hospitalizations for ambulatory care sensitive conditions. *Pediatrics*, 148(2). doi:10.1542/peds.2020-032755
- Krieger, N., Van Wye, G., Huynh, M., Waterman, P. D., Maduro, G., Li, W., . . . Bassett, M. T. (2020). Structural racism, historical redlining, and risk of preterm birth in New York City, 2013–2017. American Journal of Public Health, 110(7), 1046-1053.
- Lou, S., Giorgi, S., Liu, T., Eichstaedt, J. C., & Curtis, B. (2023). Measuring disadvantage: A systematic comparison of United States small-area disadvantage indices. *Health & Place, 80,* 102997.
- McClure, E., Feinstein, L., Cordoba, E., Douglas, C., Emch, M., Robinson, W., . . . Aiello, A. E. (2019). The legacy of redlining in the effect of foreclosures on Detroit residents' self-rated health. *Health & Place*, *55*, 9-19.
- Nardone, A., Casey, J. A., Morello-Frosch, R., Mujahid, M., Balmes, J. R., & Thakur, N. (2020).

 Associations between historical residential redlining and current age-adjusted rates of emergency department visits due to asthma across eight cities in California: an ecological study.
 The Lancet Planetary Health, 4(1), e24-e31.
- Nardone, A., Rudolph, K. E., Morello-Frosch, R., & Casey, J. A. (2021). Redlines and greenspace: The relationship between historical redlining and 2010 greenspace across the United States. *Environmental health perspectives, 129*(1), 017006.
- Noelke, C., Baek, M., Huntington, N., McArdle, N., Huber, R., Hardy, E., & Acevedo-Garcia, D. (2020). Child Opportunity Index 2.0 Technical Documentation. Retrieved from https://www.diversitydatakids.org/research-library/research-brief/how-we-built-it
- Ramgopal, S., Jaeger, L., Cercone, A., Martin-Gill, C., & Fishe, J. (2022). The Child Opportunity Index and pediatric emergency medical services utilization. *Prehospital Emergency Care*, 1-8. doi:10.1080/10903127.2022.2076268
- 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. doi:10.1097/psy.000000000000585
- Shanahan, K. H., Subramanian, S. V., Burdick, K. J., Monuteaux, M. C., Lee, L. K., & Fleegler, E. W. (2022). Association of Neighborhood Conditions and Resources for Children With Life Expectancy at Birth in the US. *JAMA network open, 5*(10), e2235912-e2235912. doi:10.1001/jamanetworkopen.2022.35912

- Slopen, N., Cosgrove, C., Acevedo-Garcia, D., Hatzenbuehler, M. L., Shonkoff, J. P., & Noelke, C. (2023). Neighborhood Opportunity and Mortality among Children and Adults in their Households,. *Pediatrics forthcoming*.
- Theall, K. P., Drury, S. S., & Shirtcliff, E. A. (2012). Cumulative neighborhood risk of psychosocial stress and allostatic load in adolescents. *American Journal of Epidemiology, 176*(suppl_7), S164-S174.
- U.S. Department of Housing and Urban Development. (2022a, June 21, 2022). Community Choice
 Demonstration Overview. *Housing Mobility Webinar Series* Retrieved from
 https://www.hud.gov/sites/dfiles/PIH/documents/Mobility Webinar Series Considerations.pdf
 #page=13
- U.S. Department of Housing and Urban Development. (2022b, June 28, 2022). Considerations for Launching a Housing Mobility Program. *Housing Mobility Webinar Series* Retrieved from https://www.hud.gov/sites/dfiles/PIH/documents/Mobility Webinar Series Considerations.pdf #page=13
- Wei, W. S., McCoy, D. C., Busby, A. K., Hanno, E. C., & Sabol, T. J. (2021). Beyond neighborhood socioeconomic status: Exploring the role of neighborhood resources for preschool classroom quality and early childhood development. *American Journal of Community Psychology, 67*(3-4), 470-485. Retrieved from https://pubmed.ncbi.nlm.nih.gov/33780018/
- Weismann, G. (2022). A Review of the New York State Housing Mobility Pilot Lessons from Buffalo, Long Island, and New York City. Retrieved from https://www.enterprisecommunity.org/sites/default/files/2022-10/prrac-review-of-ny-state-housing-mobility-pilot.pdf

Bibliography of peer-reviewed articles and reports that use the Child Opportunity Index diversitydatakids.org | March 2023

Peer-reviewed Articles – Health

- Acevedo-Garcia, D., McArdle, N., Hardy, E. F., Crisan, U. I., Romano, B., Norris, D., . . . Reece, J. (2014). The Child Opportunity Index: Improving collaboration between community development and public health. *Health Affairs (Project Hope)*, 33(11), 1948-1957. doi:10.1377/hlthaff.2014.0679.
- Akande, M. Y., Ramgopal, S., Graham, R. J., Goodman, D. M., & Heneghan, J. A. (2023). Child Opportunity Index and emergent PICU readmissions: A retrospective, cross-sectional study of 43 U.S. hospitals. *Pediatric critical care medicine*. https://doi.org/10.1097/PCC.0000000000003191
- Appleton, A. A., Lin, B., Holdsworth, E. A., Feingold, B. J., & Schell, L. M. (2021). Prenatal exposure to favorable social and environmental neighborhood conditions is associated with healthy pregnancy and infant outcomes. *International Journal of Environmental Research and Public Health, 18*(11), 13. Retrieved from https://www.mdpi.com/1660-4601/18/11/6161
- Aris, I. M., Perng, W., Dabelea, D., Padula, A. M., Alshawabkeh, A., Vélez-Vega, C. M., . . . Oken, E. (2022). Associations of Neighborhood Opportunity and Social Vulnerability With Trajectories of Childhood Body Mass Index and Obesity Among US Children. *JAMA Network Open, 5*(12), e2247957. doi:10.1001/jamanetworkopen.2022.47957.
- Aris, I. M., Rifas-Shiman, S. L., Jimenez, M. P., Li, L.-J., Hivert, M.-F., Oken, E., & James, P. (2021). Neighborhood Child Opportunity Index and adolescent cardiometabolic risk. *Pediatrics (Evanston)*. Retrieved from https://pediatrics.aappublications.org/content/early/2021/01/19/peds.2020-018903
- Beck, A. F., Huang, B., Wheeler, K., Lawson, B., Kahn, R. S., & Riley, C. L. (2017). The Child Opportunity Index and disparities in pediatric asthma hospitalization across Ohio metropolitan area, 2011-2013. *The Journal of Pediatrics*, 190, 200-206.e201.
- Bergmann, K. R., Nickel, A., Hall, M., Cutler, G., Abuzzahab, M. J., Bretscher, B., . . . Hester, G. Z. (2022). Association of neighborhood resources and race and ethnicity with readmissions for diabetic ketoacidosis at US children's hospitals. *JAMA Network Open*, *5*(5), e2210456-e2210456. doi:10.1001/jamanetworkopen.2022.10456
- Bettenhausen, J. L., Noelke, C., Ressler, R. W., Hall, M., Harris, M., Peltz, A., . . . Gay, J. C. (2021). The association of the Childhood Opportunity Index on pediatric readmissions and emergency department revisits. *Academic Pediatrics*. doi:10.1016/j.acap.2021.12.015
- Bouchard, M. E., Kan, K., Tian, Y., Casale, M., Smith, T., De Boer, C., . . . Ghomrawi, H. M. K. (2022). Association between neighborhood-level social determinants of health and access to pediatric appendicitis care. *JAMA Network Open*, *5*(2), e2148865-e2148865. doi:10.1001/jamanetworkopen.2021.48865
- Corbera-Hincapie, M. A., Kurland, K. S., Hincapie, M. R., Fabio, A., Weiner, D. J., Kim, S. C., & Kazmerski, T. M. (2021). Geospatial analysis of food deserts and their impact on health outcomes in children with cystic fibrosis. *Nutrients*, *13*(11), 11. doi:10.3390/nu13113996
- Edelson, J., Lane-Fall, M., HUANG, J., Wang, Z., Mercer-Rosa, L. M., Mitchell, J., . . . O'Byrne, M. (2022). Abstract 11485: Neighborhood Childhood Opportunity Index is Associated With Impaired Exercise Performance in Pediatric Heart Transplant Patients. *Circulation*, 146(Suppl_1), A11485-A11485. doi:doi:10.1161/circ.146.suppl_1.11485
- Fraiman, Y. S., Stewart, J. E., & Litt, J. S. (2021). Race, language, and neighborhood predict high-risk preterm Infant Follow Up Program participation. *Journal of Perinatology*. doi:10.1038/s41372-021-01188-2
- French, S. A., Fan, Y., Kunin-Batson, A. S., Berge, J. M., Kohli, N., Lamm, R. Z., & Sherwood, N. E. (2021). Three-year changes in low-income children's physical activity: Prospective influence of neighborhood environment and parent supportive behavior. *The Journal of Pediatrics: X, 6*, 100066. doi:10.1016/j.ympdx.2021.100066
- Fritz, C. Q., Fleegler, E. W., DeSouza, H., Richardson, T., Kaiser, S. V., Sills, M. R., . . . Goyal, M. (2022). Child Opportunity Index and changes in pediatric acute care utilization in the COVID-19 pandemic. *Pediatrics (Evanston)*. doi:10.1542/peds.2021-053706
- Fritz, C. Q., Hall, M., Bettenhausen, J. L., Beck, A. F., Krager, M. K., Freundlich, K. L., . . . Williams, D. J. (2022). Child Opportunity Index 2.0 and acute care utilization among children with medical complexity. *Journal of Hospital Medicine*, 1-9. doi:10.1002/jhm.12810

- Gastineau, K. A. B., Williams, D. J., Hall, M., Goyal, M. K., Wells, J., Freundlich, K. L., . . . Barkin, S. (2021). Pediatric firearm-related hospital encounters during the SARS-CoV-2 pandemic. *Pediatrics, 148*(2), e2021050223. doi:10.1542/peds.2021-050223
- Gorovoy, S., Phan, S., Begay, T., Valencia, D., Hale, L., Killgore, W., . . . Grandner, M. (2022). Neighborhood-level sleep health and Childhood Opportunity Index at the census tract level: Comparison to other health indicators. *Sleep, 45*(Supplement_1), A34-A34. doi:10.1093/sleep/zsac079.072
- Gunnar, M. R., Haapala, J., French, S. A., Sherwood, N. E., Seburg, E. M., Crain, A. L., & Kunin-Batson, A. S. (2022).

 Race/ethnicity and age associations with hair cortisol concentrations among children studied longitudinally from early through middle childhood. *Psychoneuroendocrinology*, *144*, 105892-105892. doi:10.1016/j.psyneuen.2022.105892
- Heneghan, J. A., Goodman, D. M., & Ramgopal, S. (2022). Hospitalizations at United States children's hospitals and severity of illness by neighborhood Child Opportunity Index. *The Journal of Pediatrics*. doi:10.1016/j.jpeds.2022.10.018
- Ho, B. J., Rucker, A., Boyle, M. D., Badolato, G. M., & Goyal, M. K. (2022). Relationship between food insecurity and neighborhood Child Opportunity Index. *The Journal of Pediatrics*. doi:10.1016/j.jpeds.2022.02.042
- Kaalund, K., Thoumi, A., Bhavsar, N. A., Labrador, A., & Cholera, R. (2022). Assessment of population-level disadvantage indices to inform equitable health policy. *The Milbank Quarterly*. doi:10.1111/1468-0009.12588
- Kaiser, S. V., Hall, M., Bettenhausen, J. L., Sills, M. R., Hoffmann, J. A., Noelke, C., . . . Parikh, K. (2022). Neighborhood Child Opportunity and emergency department utilization. *Pediatrics*. doi:10.1542/peds.2021-056098
- Kersten, E. E., Adler, N. E., Gottlieb, L., Jutte, D. P., Robinson, S., Roundfield, K., & LeWinn, K. Z. (2018). Neighborhood Child Opportunity and individual-level pediatric acute care use and diagnoses. *Pediatrics (Evanston), 141*(5), e20172309. doi:10.1542/peds.2017-2309
- Krager, M., Puls, H., Bettenhausen, J., Hall, M., Noelke, C., Plencner, L., . . . Beck, A. (2020). *Association between Child Opportunity Index 2.0 and hospitalizations for ambulatory care sensitive conditions.* Paper presented at the Pediatric Hospital Medicine PHM20 Virtual.
- Krager, M., Puls, H., Bettenhausen, J., Hall, M., Noelke, C., Plencner, L., . . . Beck, A. (2021). The Child Opportunity Index 2.0 and Hospitalizations for Ambulatory Care Sensitive Conditions. *Pediatrics, 148*(2). doi:10.1542/peds.2020-032755
- Macy, M. L., Smith, T. L., Cartland, J., Golbeck, E., & Davis, M. M. (2021). Parent-reported hesitancy to seek emergency care for children at the crest of the first wave of COVID-19 in Chicago. *Academic Emergency Medicine*. doi:10.1111/acem.14214
- Mayourian, J., Brown, E., Javalkar, K., Bucholz, E., Gauvreau, K., Beroukhim, R., . . . Dionne, A. (2022). Insight into the role of socioeconomic status and Child Opportunity on surgical outcomes in congenital heart disease. *Journal of the American College of Cardiology*, 79(9 Supplement), 1356-1356. doi:10.1016/S0735-1097(22)02347-6
- Najjar, N., Opolka, C., Fitzpatrick, A. M., & Grunwell, J. R. (2022). Geospatial analysis of social determinants of health identifies neighborhood hot spots associated with pediatric intensive care use for acute respiratory failure requiring mechanical ventilation. *Pediatric Critical Care Medicine, 23*(8). Retrieved from https://journals.lww.com/pccmjournal/Fulltext/2022/08000/Geospatial_Analysis_of_Social_Determinants_of.4. aspx
- Ni, Y., Loftus, C. T., Szpiro, A. A., Young, M. T., Hazlehurst, M. F., Murphy, L. E., . . . Karr, C. J. (2022). Associations of Preand Postnatal Air Pollution Exposures with Child Behavioral Problems and Cognitive Performance: A U.S. Multi-Cohort Study. *Environmental Health Perspectives*, 130(6), 67008-67008. doi:10.1289/EHP10248
- Ramgopal, S., Jaeger, L., Cercone, A., Martin-Gill, C., & Fishe, J. (2022). The Child Opportunity Index and pediatric emergency medical services utilization. *Prehospital Emergency Care*, 1-8. doi:10.1080/10903127.2022.2076268
- Rodriguez, V. A., Goodman, D. M., Bayldon, B., Budin, L., Michelson, K. N., Garfield, C. F., . . . Schroeder, S. K. (2019).

 Pediatric readmissions within 3 days of discharge: Preventability, contributing factors, and necessity. *Hospital Pediatrics*, *9*(4), 241-248. doi:10.1542/hpeds.2018-0159
- 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. doi:10.1097/psy.000000000000585.
- Schultz, C. L., McCahan, S. M., Lewis, A. M., Bunnell, H. T., & Alderfer, M. A. (2021). Online patient portal use by caregivers in pediatric oncology: Are we widening sociodemographic disparities? *Pediatric Blood & Cancer,* 68, 12. doi:10.1002/pbc.29373



- Shanahan, K. H., Subramanian, S. V., Burdick, K. J., Monuteaux, M. C., Lee, L. K., & Fleegler, E. W. (2022). Association of neighborhood conditions and resources for children with life expectancy at birth in the US. *JAMA Network Open*, *5*(10), e2235912-e2235912. doi:10.1001/jamanetworkopen.2022.35912
- Shelby, G. (2018). Assessing disparities in asthma among children across neighborhoods of a large metropolitan area: The Child Opportunity Index. *Journal of Ethnic and Cultural Studies*, 5(2), 186-195. Retrieved from http://www.ejecs.org/index.php/JECS/article/view/135
- Slopen, N., Cosgrove, C., Acevedo-Garcia, D., Hatzenbuehler, M. L., Shonkoff, J. P., & Noelke, C. (2023). Neighborhood Opportunity and mortality among children and adults in their households. *Pediatrics (Evanston)*. https://publications.aap.org/pediatrics/article-abstract/doi/10.1542/peds.2022-058316/190871/Neighborhood-Opportunity-and-Mortality-Among
- Thorpe, D., & Klein, D. N. (2022). The effect of neighborhood-level resources on children's physical development:

 Trajectories of Body Mass Index and pubertal development and the influence of child biological sex. *Journal of Youth and Adolescence*. doi:10.1007/s10964-021-01547-4
- Tyris, J., Boggs, K., Bost, J., Dixon, G., Gayle, T., Harahsheh, A. S., . . . Parikh, K. (2022). Examining the association between MIS-C and the Child Opportunity Index at a single center. *Hospital Pediatrics, 12*(10), e342-e348. doi:10.1542/hpeds.2022-006524
- Yu, A. G., Hall, M., Agharokh, L., Lee, B. C., Zaniletti, I., Wilson, K. M., & Williams, D. J. (2022). Hospital-Level Neighborhood Opportunity and Rehospitalization for Common Diagnoses at U.S. Children's Hospitals. *Academic Pediatrics*. doi:10.1016/j.acap.2022.05.008
- Zewdie, H., Zhao, A. Y., Patel, H. H., Hansen, E., Messiah, S. E., Armstrong, S. C., . . . D'Agostino, E. M. (2021). The association between neighborhood quality, youth physical fitness, and modifiable cardiovascular disease risk factors. *Annals of Epidemiology*, *57*, 30-39. doi:10.1016/j.annepidem.2021.02.004

Peer-reviewed Articles - Housing

- Acevedo-Garcia, D., McArdle, N., Hardy, E., Dillman, K.-N., Reece, J., Crisan, U. I., Norris, D., & Osypuk, T. L. (2016). Neighborhood opportunity and location affordability for low-income renter families. *Housing Policy Debate*, 26(4-5), 607-645. https://doi.org/10.1080/10511482.2016.1198410
- Besbris, M., Kuk, J., Owens, A., & Schachter, A. (2022). Predatory inclusion in the market for rental housing: A multicity empirical test. *Socius: Sociological Research for a Dynamic World, 8.* doi:10.1177/23780231221079001
- Carrillo, L., Pattillo, M., Hardy, E., & Acevedo-Garcia, D. (2016). Housing decisions among low-income Hispanic households in Chicago. *Cityscape (Washington, D.C.)*, *18*(2), 109-150.
- Kim, H., Schmidt, N. M., Osypuk, T. L., Thyden, N., & Rehkopf, D. (2022). Effects of housing vouchers on the long-term exposure to neighbourhood opportunity among low-income families: the moving to opportunity experiment. *Housing Studies*, 1-24. doi:10.1080/02673037.2022.2112154
- Schmidt, N. M., Glymour, M. M. G., & Osypuk, T. L. (2020). Does the temporal pattern of moving to a higher quality neighborhood across a 5-year period predict psychological distress among adolescents? Results from a federal housing experiment. *American Journal of Epidemiology*. doi:10.1093/aje/kwaa256

Peer-reviewed Articles - Early Childhood, Education and Parenting

- Burt, S. A., Thaler, D., Shewark, E. A., Pearson, A. L., Anaya, C., Tomlinson, R. C., . . . Lonstein, J. S. (2022). Illuminating associations between parenting and deleterious neighborhood characteristics via exhaustive modeling. *Journal of Marriage and Family, n/a*(n/a). doi:10.1111/jomf.12871
- Cubides-Mateus, D. M., LoCasale-Crouch, J., & Turnbull, K. L. P. (2023). Do neighborhood resources mitigate family risk to preschool children's executive function skills growth? *Prevention science*, *24*(1), 115-125. https://doi.org/10.1007/s11121-022-01480-3
- Hanno, E. C., Gardner, M., Jones, S. M., & Lesaux, N. K. (2022). An ecological perspective on early educator well-being at the start of the COVID-19 pandemic. *Early Childhood Research Quarterly, 60*, 214-225. doi:10.1016/j.ecresq.2022.02.002



- Lenahan, T., LoCasale-Crouch, J., Chamberlain, C., Williford, A., Downer, J., Whittaker, J., & Miller, L. (2022). Examining the association between neighborhood conditions and school readiness across low and highly segregated school attendance boundaries. *Frontiers in Education, 7.* doi:10.3389/feduc.2022.932558
- Opara, I., Thorpe, D., & Lardier, D. T. (2022). School absenteeism and neighborhood deprivation and threat: Utilizing the Child Opportunity Index to assess for neighborhood-level disparities in Passaic County, NJ. *Urban education (Beverly Hills, Calif.)*, 4208592211257. https://doi.org/10.1177/00420859221125704
- Shonkoff, J. P., Slopen, N., & Williams, D. R. (2021). Early childhood adversity, toxic stress, and the impacts of racism on the foundations of health. *Annual Review of Public Health*, *42*, 115-134. doi:10.1146/annurev-publhealth-090419-101940

Peer-reviewed Articles - Analysis and Comparisons of Neighborhood Indices

- Acevedo-Garcia, D., Noelke, C., McArdle, N., Sofer, N., Hardy, E., Weiner, M., . . . Reece, J. (2020). Racial and ethnic inequities in children's neighborhoods: Evidence from the new Child Opportunity Index 2.0. *Health Affairs* (*Project Hope*), 39(10), 1693-1701. doi:10.1377/hlthaff.2020.00735
- Brazil, N., Wagner, J., & Ramil, R. (2022). Measuring and mapping neighborhood opportunity: A comparison of opportunity indices in California. *Environment and Planning B: Urban Analytics and City Science*. doi:10.1177/23998083221129616
- Mast, B. D., & Din, A. (2021). Measuring neighborhood opportunity with Opportunity Atlas and Child Opportunity Index 2.0 data. *Cityscape*, *23*(1), 237-256. Retrieved from https://www.jstor.org/stable/26999947
- Sandel, M., Faugno, E., Mingo, A., Cannon, J. B. S., Byrd, K., Garcia, D. A., . . . Jarrett, R. B. (2016). Neighborhood-level interventions to improve Childhood Opportunity and lift children out of poverty. *Academic Pediatrics, 16*(3), S128-S135. doi:10.1016/j.acap.2016.01.013
- Trinidad, S., Brokamp, C., Mor Huertas, A., Beck, A. F., Riley, C. L., Rasnik, E., . . . Kotagal, M. (2022). Use of area-based socioeconomic deprivation indices: A scoping review and qualitative analysis. *Health Affairs, 41*(12), 1804-1811. doi:10.1377/hlthaff.2022.00482

Reports, Community Health Needs Assessments and Resources

- AEI-Brookings Working Group on Childhood in the United States. (2022). *Rebalancing: Children First*. Retrieved from https://www.brookings.edu/wp-content/uploads/2022/02/ES_20220228_Rebalancing_Children_First.pdf.
- Alliance for Health Equity. (2019). Community Health Needs Assessment for Chicago and suburban Cook county.

 Retrieved from https://allhealthequity.org/wp-content/uploads/2019/06/FINAL_2019_CHNA-Report_Alliance-for-Health-Equity.pdf
- Ann and Robert H. Lurie Children's Hospital of Chicago. (2019). 2019 Community Health Needs Assessment for Chicago youth, adolescents and families. Retrieved from https://www.luriechildrens.org/globalassets/documents/luriechildrens.org/ community/community-health-needs-assessment/chna-2019.pdf
- Chicago Department of Public Health. (2019). *Healthy Chicago 2025 Data Compendium*. Retrieved from https://www.chicago.gov/content/dam/city/depts/cdph/CDPH/Healthy_Chicago_2025_Data-Compendium_10222019.pdf
- Churchwell, K. B., & Williams, M. A. (2022). Every child deserves good health. That requires urgent action on equity. *The Boston Globe*. Retrieved from https://www.bostonglobe.com/2022/04/05/opinion/every-child-deserves-good-health-that-requires-urgent-action-equity/
- Commonwealth of Massachusetts. (2021). Supporting Neighborhood Opportunity in Massachusetts (SNO Mass)

 Program. Retrieved from https://www.mass.gov/info-details/supporting-neighborhood-opportunity-inmassachusetts-sno-mass-program
- Commonwealth of Massachusetts Department of Housing and Community Development. (2019). *Moving to work program: Annual report for fiscal year 2019*. Retrieved from https://www.hud.gov/sites/dfiles/PIH/documents/MassFY19Report.pdf



- Curley, A. M., Graves, E. M., & Weismann, G. (2019). Barriers and opportunities in the housing voucher program: The importance of race in the housing search process. Retrieved from https://www.bostonfed.org/publications/community-development-issue-briefs/2019/barriers-opportunities-housing-voucher-program.aspx
- Davey Resource Group Inc. (2020). 2020 State of Canopy report. Retrieved from https://www.akronohio.gov/cms/resource_library/files/581087c52852896c/2021_akron_urban_tree_canopy_a ssessment_and_planting_plan.pdf
- Dircksen, J. C., & Prachand, N. G. (2016). *Healthy Chicago 2.0: Partnering to improve health equity*. Retrieved from https://www.chicago.gov/content/dam/city/depts/cdph/CDPH/Healthy%20Chicago/HC2.0Upd4152016.pdf.
- Dwyer, G. (2021). Neighborhoods of focus: 2022 Community Health Needs Assessment focus neighborhoods have been identified using the Child Opportunity Index. Retrieved from https://storymaps.arcqis.com/stories/06f3afd29a7340048018a4249d9695b9
- Health Impact Collaborative of Cook County. (2016). *Community Health Needs Assessment Central Region*. Retrieved from https://www.loyolamedicine.org/sites/default/files/community-health-needs-assessment-june2016.pdf
- Health Impact Collaborative of Cook County. (2016). *Community Health Needs Assessment North Region*. Retrieved from https://www.advocatehealth.com/assets/documents/hiccc-north-region-chna-report-with-appendices_31october2016.pdf
- Juvenile Welfare Board of Pinellas County. (2018). Kids Data Center, Pinellas Child Opportunity Index. Retrieved from https://www.jwbpinellas.org/kids-data-center/
- Kim, J., & Loh, T. H. (2020). How we define 'need' for place-based policy reveals where poverty and race intersect.

 Retrieved from https://www.brookings.edu/research/how-we-define-need-for-place-based-policy-reveals-where-poverty-and-race-intersect/
- Le, T., Muña, E., Treuhaft, S., & Phillips, R. (2022). *The Shrinking Geography of Opportunity in Metro America*. PolicyLink/USC Equity Research Institute, National Equity Atlas. Retrieved from https://nationalequityatlas.org/shrinking-geography-of-opportunity
- Loyola University Medical Center. (2019). *Community Health Needs Assessment 2019*. Retrieved from https://loyolamedicine.org/sites/default/files/2019_chna_report_lumc.pdf
- New Hampshire Legal Assistance. (2021). *Analysis of impediments to Fair Housing Choice in New Hampshire*. Retrieved from https://www.nhhfa.org/wp-content/uploads/2021/04/2020-Analysis-Impediments-Fair-Housing-ChoiceNH.pdf
- Project Hope. (2020). Selecting indicators for early childhood systems change projects. Retrieved from https://www.movinghealthcareupstream.org/wp-content/uploads/2020/09/Indicator-Reference-Guide-FINAL.pdf
- Qin, A., Reagor, C., & Boehm, J. Housing vouchers are meant to give low-income tenants choices about where to live and a chance to move to a better neighborhood. That doesn't happen often. Retrieved from https://www.azcentral.com/in-depth/money/real-estate/2022/08/16/housing-voucher-use-metro-phoenix-concentrated-mostly-lower-income-areas/10158391002/
- Rackers, H., Habteselasse, S., Lantos, H., & Redd, Z. *A Review of Tools Measuring Opportunity in the United States*.

 Retrieved from http://opportunityindex.org/wp-content/uploads/2020/08/A-Review-of-Tools-Measuring-Opportunity-in-the-United-States.pdf
- Reilly, R., Newman, D., & Fikri, K. (2020). *Advancing education and child development in Opportunity zones*. Retrieved from https://eig.org/wp-content/uploads/2020/09/oz-education-report.pdf
- Rush University Medical Center. (2016). *Rush University Medical Center Community Health Needs Assessment Report*. Retrieved from https://www.rush.edu/sites/default/files/2020-09/rush-chna-august-2016%284%29.PDF
- The Chicago Department of Public Health. Healthy Chicago 2.0 Indicators. Retrieved from https://www.chicagohealthatlas.org/healthy-chicago.
- The Health Collaborative. (2019). 2019 Bexar County and Atascosa County Community Health Needs Assessment Report. Retrieved from San Antonio, TX: http://healthcollaborative.net/wp-content/uploads/2019/10/Community2019_CHNAReport_compressed.pdf
- Weismann, G., Tegeler, P., & Knudsen, B. (2022). A Review of the New York State Housing Mobility Pilot: Lessons from Buffalo, Long Island and New York City. Enterprise Community Partners, PRRAC, Mobility Works. Retrieved from: https://www.enterprisecommunity.org/sites/default/files/2022-10/prrac-review-of-ny-state-housing-mobility-pilot.pdf.

