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## Neighborhood Eviction Trajectories and Odds of Moderate and Serious Psychological Distress During Pregnancy Among African American Women

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**Title:** Neighborhood Eviction Trajectories and Odds of Moderate and Serious Psychological Distress During Pregnancy among African American Women

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**Key words:** psychological distress, reproductive justice, residential eviction, neighborhood effects on health, African American women, Lifecourse Theory, housing justice, structural racism

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## Abstract

African American mothers are unjustly burdened both by residential evictions and psychological distress. We quantified associations between trajectories of neighborhood evictions over time, and odds of moderate and serious psychological distress (MPD and SPD, respectively) during pregnancy among African American women. We linked publicly available neighborhood eviction filing and judgement rate data to preconception and during pregnancy addresses from the Life-course Influences on Fetal Environments Study (2009-2011, n=808). Multinomial logistic regression estimated odds of MPD and SPD during pregnancy associated with eviction filing and judgement rate trajectories incorporating preconception and during pregnancy addresses (each categorized as low/medium/high, with two 9-category trajectory measures). Psychological distress was measured with the Kessler (K6) scale (scores between 5-12 = MPD, and  $\geq 13$  = SPD). MPD was reported in 60% and SPD in 8% of the sample. Higher neighborhood eviction filing and judgement rates, compared to low/low in the preconception and pregnancy periods was associated with between 2- and 4-fold higher odds of both MDP and SPD during pregnancy among African American women, in adjusted models. Future studies should identify mechanisms of these findings to inform timely community-based interventions and effective policy solutions to ensure the basic human right to housing for all.

Psychological distress is defined as a negative psychological response to stressors which may include nervousness, unhappiness, irritation, and overwhelm.<sup>1,2</sup> Psychological distress measurement exists on a continuum, including none or low, moderate, and serious mental distress causing significant impairment and meeting the diagnostic and statistical manual of mental disorders criteria for a mental illness<sup>3,4</sup>. Notably, moderate psychological distress (MPD) is an important outcome to study given that it allows for the identification of those who have clinically relevant (though sub-diagnostic) mental distress and could benefit from mental health interventions.<sup>4</sup> Recent estimates suggest that 3.4% of the overall U.S. adult population has serious psychological distress (SPD), and inequities by gender and race have been documented.<sup>5</sup> Increases in national rates of suicide, opioid misuse disorder and associated overdose deaths suggest increasing psychological distress.<sup>6-8</sup>

African American women are among those who are disproportionately impacted SPD<sup>5,9</sup>. Manifestations of structural racism, which is a root cause of racial inequities in population health,<sup>10,11</sup> may explain this unequal burden. Defined by scholars as the “totality of ways in which societies foster racial discrimination through mutually reinforcing systems of housing, education, employment, earnings, benefits, credit, media, health care, and criminal justice”<sup>12</sup>, structural racism deserves more empirical attention because documenting the impact on population health is important for identifying solutions.

A key pervasive manifestation of structural racism is racial and economic residential segregation<sup>12</sup> and concomitant discrimination in the rental and housing markets<sup>13</sup>. For example, home appraisal discrimination in low income neighborhoods leads to lower property values, making many of these neighborhoods prime targets for gentrification<sup>14,15</sup>. In a vicious cycle, landlords can use various strategies to remove tenants from their units so that they can renovate and charge higher rent. As rent increases in gentrifying areas, tenants may be unable to afford their housing leading to nonpayment of rent and evictions<sup>15</sup>. Mass evictions in neighborhoods lead to housing instability, displacement of communities, separation of social networks, and decreased access to resources.<sup>15,16</sup> A growing literature documents that housing instability caused by residential evictions unjustly impacts African American mothers.<sup>17-19</sup>

Numerous studies have examined associations between various neighborhood characteristics and mental health outcomes, though studies of the potential spillover effects of neighborhood housing conditions<sup>20</sup> on individual mental health are few<sup>21</sup>. A recent review documented the potential pathways through which mental health, including psychological distress, could be negatively impacted by neighborhood level threat of eviction.<sup>22</sup> Despite possible reverse causation and the dearth of studies evaluating changes over time, a true “neighborhood effect” on mental health is likely<sup>23</sup>, because living in a neighborhood with high rates of evictions may lead to anticipatory stress about potentially experiencing one yourself,<sup>24</sup> and we would expect that personal experiences of forced residential evictions, or the threat of eviction, to have even greater effects.

Structural racism limits the opportunity of African American mothers to have safe, secure, affordable, and sustainable housing, and increases their risk for adverse maternal health outcomes.<sup>25</sup> Research on macro-social determinants of health is ever more important given

the worsening injustices in African American maternal health<sup>26</sup>. Researchers have hypothesized that SPD during pregnancy lies on the pathway between disadvantaged neighborhood context and adverse pregnancy outcomes, though this connection has not been conclusively established.<sup>27</sup> Given the literature on stress, fetal programming, and maternal wellbeing<sup>28,29</sup>, there is a glaring gap in the epidemiologic literature of research leveraging a life-course framework and focused on neighborhood level eviction as a predictor of MPD and SPD *among* African American women. Many epidemiology studies document racial inequities in population health with racial group comparisons, with much less attention to within-group empirical analyses, and this has stalled our ability to identify risk and protective factors<sup>30</sup> among segments of our population that are made vulnerable to poor health and premature mortality by structural racism. Calls have been made for rigorous studies focusing on neighborhood change among different population groups and geographic locations,<sup>31</sup> and for studies that use objective measures of urban neighborhood environments.<sup>32</sup>

Life-course epidemiology requires conceptual rigor and novel data linkages to investigate the accumulation of exposures over time, especially sensitive periods of exposure<sup>33</sup> to appropriately conceptualize and statistically model from a life-course epidemiological view “explicitly require[s] the temporal ordering of exposures and their inter-relationships”.<sup>34</sup> Here, we focus on the perinatal and during pregnancy periods among Black mothers within the context of historical and contemporary structural racism in the US. A critical if understudied manifestation of structural racism is vicarious racism: instances of prejudice and discrimination that happen to relatives, close friends, or strangers with shared identities<sup>35</sup>. Reproductive Justice (RJ) deepens the study of these sensitive periods and further contextualizes vicarious racism. Defined as the interconnected human rights to have children, not have children, and parent children in safe and healthy environments free from individual and/or state violence<sup>36</sup>, RJ should be the foundation of scholarship on the worsening African American maternal health crisis. RJ makes clear the importance of understanding the trauma of living in a neighborhood where your neighbors, some of whom may be family members or close friends, experience the threat of eviction or are forced to move because of a court order. Given the gaps in the literature, and the potential public health and policy relevance, our objectives were to examine associations between neighborhood eviction filing and judgement rate trajectories over time and odds of MPD and SPD during pregnancy among African American mothers. We hypothesize that both exposure variables, one reflecting the threat of eviction (filings), and one reflecting the forced displacement of neighbors (judgements) is detrimental to the mental health of African American mothers.

## Methods

### Sample

This study uses data collected from the Life-course Influences on Fetal Environments Study (LIFE) which has been described elsewhere<sup>37</sup>. Briefly, the LIFE study is a retrospective cohort of African American women between 18-45 years old who were enrolled between 2009-2011 at a suburban hospital in Metropolitan Detroit, Michigan (n=1410, which

represents 71% of the women who were invited to participate). LIFE was originally conducted to determine whether and how racism is associated with preterm birth in African American women. Exclusion criteria included: non-English speaking, intellectual disabilities, serious cognitive deficits, or evidence of mental illness (on the basis of any prior records or history). In-person interviews were completed during the postpartum hospital stay. This study was restricted to women who reported their address two years before and at study enrollment, and whose address was able to be matched to latitude and longitude using ArcGIS 10.8.2 (n=808). Informed consent was obtained from all LIFE study participants, and all appropriate institutional review boards approved the LIFE study. This secondary data analysis of LIFE study data, as a part of the Social Epidemiology to Combat Unjust Residential Evictions (SECURE) study, was determined to be exempt from IRB review by the Office of Responsible Research Practices at Ohio State University.

### **Exposure ascertainment**

Residential eviction cases are usually heard in county-level civil courts, with eviction cases being resolved by either: (1) an eviction judgement, where the tenant receives a time-sensitive order to move from the residence by a judge, (2) the eviction case is dismissed and the tenant is allowed to remain in the residence, or (3) a mediated agreement between the tenant and landlord in which the eviction is dismissed if the tenant follows a negotiated payment schedule, or an eviction judgement is rendered if the tenant does not adhere to the agreement<sup>38</sup>. Our exposures of interest included block group level eviction filings and eviction judgment rates.

The neighborhood-level eviction filing rates are interpreted as a ratio of all eviction cases filed, counting multiple cases filed against the same address in the same year, divided by the total renter-occupied homes in that block group. The neighborhood-level eviction judgement rate are interpreted as the ratio of the number of renter-occupied households in the block group that received an eviction judgement by the court (addresses were only counted once per year) divided by the total renter-occupied homes in that block group. The eviction rates were calculated using the original, non-rounded values to prevent inflation of the estimates, to correspond to the number of evictions per 100 renter-occupied homes and were validated at the individual and aggregate levels. We used block groups to represent neighborhoods and linked publicly available data (standardized to reflect Census 2010 boundaries) on court-ordered eviction rates from 2007 -2011 from the Eviction Lab at Princeton University<sup>38</sup> to the latitude and longitude of past and during pregnancy addresses of LIFE study participants. Study participant reported their addresses before enrollment (considered preconception, from 2007-2009), and at enrollment (during pregnancy, from 2009-2011). We matched neighborhood level eviction rates to LIFE study participant addresses at two time points, based on the year the address corresponded to (for example, preconception eviction rates for 2007 were linked to LIFE study participants who enrolled in 2009 and reported their address from two years before enrollment).

### **Outcome ascertainment**

Psychological distress during the past 30 days was measured with the Kessler Psychological Distress Scale (K6).<sup>3</sup> Study participants recounted how often they felt:

nervous, hopeless, restless or fidgety, so depressed that nothing could cheer them up, that everything was an effort, and worthless, on a 5-point Likert scale (all of the time to none of the time). Individual K6 items were reverse coded and summed, higher scores represent higher levels of psychological distress, and the range of scores in our analytic was 0-24 (mean: 6.67, median: 6, Standard deviation: 4.09). Internal consistency reliability of the Psychological Distress Scale was 0.72.

## Covariates

As where people live is non-random<sup>39</sup>, we adjusted our analyses for the following predictors of residential selection: age (< 35, 35+), income (dichotomized at \$35,000 per year), educational attainment ( $\leq 12$ , >12 years); we also controlled for time lived in the during pregnancy neighborhood (dichotomized at 2 years), and a block-group level neighborhood disadvantage index used in prior work<sup>40</sup>.

## Statistical analysis

We used univariable and multivariable statistics to describe the data, including chi-square and Wilcoxon rank sum tests to examine differences in categorical and continuous variables. We estimated Spearman correlations among neighborhood eviction measures, and missing data on all covariates ranged between 0-10%. Given that there was little block-group level variation in psychological distress (which precludes hierarchical modeling), and evidence that the proportional odds assumption is not valid in our data, we used multinomial logistic regression to estimate unadjusted and adjusted odds ratios (ORs) and associated 95% confidence intervals (CI) for associations between trajectories of neighborhood eviction filing and judgements over time and odds of (1) MPD (K6 scores between 5-12), and (2) SPD (K6 score of 13+) during pregnancy, compared to none (0-4).

To examine continued exposure as well as change in exposure<sup>41</sup> to neighborhood eviction filing and judgements, we categorized each rate at each time point into tertiles (low/medium/high). Trajectory measures incorporated preconception and during pregnancy neighborhood eviction filing and judgement rates and each had nine categories representing the following preconception/during pregnancy neighborhood combinations: (1) low/low, (2) low/medium, (3) low/high, (4) medium/low, (5) medium/medium, (6) medium/high, (7) high/low, (8) high/medium, and (9) high/high. Women who lived in neighborhoods with low/low eviction filing and judgement rates were the referent group. We used ArcGIS 10.8.2 to geocode preconception addresses, and during pregnancy addresses were previously geocoded and linked to data from the eviction lab.<sup>19,38</sup> SAS version 9.4 for Windows for the analyses (SAS Institute Inc., Cary, NC, USA) for statistical analyses.

## Results

The mean age of the sample was 27 years, and over half were: married to or living with the father of their baby, had an income of < \$35,000 per year and lived in their during pregnancy neighborhood for less than 2 years. Nearly 70% of the sample had >12 years of



education, and the majority enrolled in the study in the year 2011 (Table 1) In terms of the prevalence of psychological distress during pregnancy, 30% of the sample reported no psychological distress, 60% reported MPD, and 8% reported SPD.

In bivariate models (Table 1), older maternal age at birth (35+ years) was associated with protection against odds of MPD (OR: 0.50, 95% CI: 0.30, 0.82) and SPD (OR: 0.50, 95% CI: 0.19, 1.29) during pregnancy. Being married to or living with the father of the baby was associated with protection against SPD during pregnancy in bivariate models (OR: 0.30, 95% CI: 0.17, 0.54). Further, in bivariate models, low income (<\$35,000/year) was associated with increased odds of MPD (OR: 1.40, 95% CI: 1.01, 1.93) and (OR: 3.82, 95% CI: 1.91, 7.64) SPD during pregnancy. Finally, residing in the during pregnancy neighborhood for at least 24 months was associated with lower odds of MPD during pregnancy (OR: 0.67, 95% CI: 0.49, 0.92), and those who enrolled in the year 2011 had lower odds of SPD during pregnancy (OR: 0.35, 95% CI: 0.16, 0.74).

All correlations between eviction filing and judgement rates in the preconception and during pregnancy neighborhood were different from 0 ( $p < 0.05$ ) (Table 2). Correlations between eviction filing and judgement rates in the preconception (0.73) and during pregnancy neighborhoods (0.70) were strongest. The weakest correlation was between preconception eviction filing and during pregnancy eviction judgement rates (0.20). In the preconception period, our study participants lived in neighborhoods with an average eviction filing rate of 24.85 per 100 renter occupied homes (SD: 16.12), and 26.14 per 100 renter occupied homes (SD: 16.53) in the during pregnancy neighborhood. The mean preconception neighborhood eviction judgement rate was 10.23 per 100 renter occupied homes (SD: 7.37), and for the during pregnancy neighborhood: 8.79 per 100 renter occupied homes (SD: 6.87). The range of eviction filing rates widened comparing preconception (0-116.71 per 100 renter-occupied homes) to during pregnancy (0-132 per 100 renter-occupied homes) neighborhood. A similar widening of the range of eviction judgement rates comparing preconception (0 - 48.39 per 100 renter-occupied homes) to during pregnancy neighborhoods (0 - 59 per 100 renter-occupied homes) was observed.

For the eviction judgement rate trajectories, the low/low category had the highest percentage of participants (15.7%) and the low/high trajectory had the lowest (8%) (Table 3). For eviction filing rate trajectories, the low/low category had the highest proportion of participants (15.5%), and the high/low group had the lowest (7%). For eviction filing rates, the medium/medium trajectory had a range of 17.2 - 31 per 100 renter occupied homes over the two time periods, and the medium/high trajectory had approximately 20 more filings in the during pregnancy neighborhood, with a range of 17.2-132 per 100 renter occupied homes across the two time points (Table 4). The range of neighborhood eviction judgement rates for the medium/medium trajectory was between 6 and 11.81 per 100 renter occupied homes from preconception to during pregnancy. The medium/high eviction judgement trajectory had on average 7 more eviction judgements comparing preconception to during pregnancy neighborhoods, with a range of 6.29-11.81 in the preconception neighborhood, and 10-59 per 100 renter occupied homes in the during pregnancy neighborhood. Change in eviction judgement rates for the low/medium

trajectory was approximately 3 more eviction judgements in the during pregnancy neighborhood, per 100 renter occupied homes (range: 0-9).

Compared to women who lived in neighborhoods with low/low eviction filing rates, we observed greater than a twofold increase in odds of MPD during pregnancy for both those who lived in medium/medium (aOR: 2.45, 95% CI: 1.29, 4.66) and medium/high trajectories (aOR: 2.67, 95% CI: 1.13, 5.46) (Table 5). Similar associations were observed for eviction judgement rates as predictors of MPD during pregnancy in the medium/medium (aOR: 2.25, 95% CI: 1.16, 4.34), and medium/high (aOR: 2.24, 95% CI: 1.11, 4.52) trajectories. Odds of SPD during pregnancy was threefold higher for women who lived in the medium/medium trajectory of eviction filing rates (aOR: 3.31, 95% CI: 1.04, 10.49), and fourfold higher for those in the low/medium trajectory for eviction judgement rates (aOR: 4.01, 95% CI: 1.18, 13.74), both compared to those in the low/low group (Table 6).

## Discussion

The main finding of this study was that living in a neighborhood with higher eviction filing and judgement rates during the preconception and pregnancy periods was associated with increased odds of MPD and SPD during pregnancy among African American women. Specifically, greater than a twofold increase in odds of MPD during pregnancy was associated with stable medium and medium/high eviction filing and judgement rates, across the preconception and pregnancy periods. We also observed a threefold increase in odds of SPD for women who lived in stable medium and a fourfold increase in odds for those who lived in low/medium trajectory for eviction judgement rates.

Importantly, prior evidence that SPD risk among African Americans is associated with their relatives' homelessness highlights the salience of investigating the larger social context in which this group is embedded.<sup>30</sup> Observing neighbors being evicted likely increases fear of experiencing a similar fate, especially if one has the same landlord as neighbors experiencing eviction. In a prior study using LIFE study data, we reported higher eviction rates in the neighborhoods our study participants lived, compared to average rates in the tri-county area, Michigan, and the United States<sup>19</sup>. It is also important to emphasize the magnitude of change in eviction filing and judgement rates from the preconception to pregnancy periods that are associated with increased odds of MPD and SPD during pregnancy among African American women in this study. The average change in eviction filing rates from the preconception to pregnancy period for the medium to high trajectory corresponded to approximately 20 more eviction filings per 100 renter-occupied homes. For eviction judgements, the average change from medium to high corresponded to about 7, and low to medium was approximately 3 more eviction judgements per 100 renter occupied homes.

Not surprisingly, lower income (<\$35,000/year) was associated with increased odds of both MPD and SPD during pregnancy, in bivariate models. We also found that older maternal age at birth was associated with lower odds of MDP and SPD during pregnancy,

being married to or living with the father of the baby and residing in the during pregnancy neighborhood for more at least 2 years was associated with lower odds of SPD and MPD (respectively) during pregnancy, in bivariate models. African American women who have increased risk of poor mental health because they are made vulnerable to a life-course accumulation of adverse contextual exposures that result from structural racism should be the beneficiaries of future research and interventions focused on scalable protective factors as well as policy change.

A higher percentage of our analysis sub-sample (from 2009-2011) reported SPD during pregnancy (8%), compared to the 4.8% overall prevalence estimate from a nationally representative sample from 2008-2012, though ours is similar to rates among the pregnant and postpartum African American women in their analytic sample (7.5% and 6.7% respectively).<sup>42</sup> Sixty percent of our analysis subsample reported MPD, but few studies have documented the prevalence of this important outcome during pregnancy among African American women. Using data from the National Health Interview Survey researchers reported that 14.9% of reproductive age African American women had MPD, and 14% had SPD from 2015-2016.<sup>43</sup> In a recent nationally representative study of community dwelling adults, 16% of the African American participants had serious and 57% had MPD, and it is surprising that the prevalence of MPD in our cohort was higher than that reported for African Americans during the COVID-19 pandemic<sup>44</sup>. These results highlight the geographic, life-stage, and temporal differences in mental health within African American communities, and should inform future individual, community, and society-level interventions.

Critically, taking a life-course perspective, our study focused on maternal perinatal psychological distress, which is related to pregnancy, parenting, or other stressful life events that occurred during pregnancy.<sup>45</sup> We focus on sensitive periods of development for both the mother and infant, as the prenatal and immediate postpartum period represent a time of increased vulnerability to maternal stress<sup>46</sup>, as well as threats to the physical and neurobiological development of the infant.<sup>47,48</sup> Studies show that African American women of reproductive age have unacceptably low rates of mental healthcare,<sup>42,43,49</sup> and our results suggest that macro-social interventions focused on addressing the society level root causes of poor mental health during pregnancy among African American women are warranted.

### Limitations

We do not have data on length of residence in the preconception neighborhood. As well, it is possible that the neighborhood level eviction filing and judgement rates at both time periods could have involved LIFE study participants themselves. The eviction data used in this study is limited to court-ordered evictions, which does not account for illegal evictions. These illegal eviction include strong-arm lockouts, threats, landlord neglect, etc., that account for ~50% of all evictions<sup>50</sup>, and this suggests that our large measures of association (even with some estimate imprecision due to the small sample size with SPD) are underestimates. The currently underway SECURE study is documenting the magnitude and severity of on court-ordered and illegal evictions and will fill important gaps in our knowledge about this source of housing instability, as well as impacts on African American women, families, and communities. Given our study design, we cannot rule out the

possibility of reverse causation, and future longitudinal studies with baseline psychological distress assessments are needed to establish temporality.

### **Strengths**

This is the first study to examine whether trajectories of neighborhood eviction rates – importantly, including preconception and during pregnancy-- as a manifestation of structural racism, are associated with odds of MPD and SPD during pregnancy among African American women. We performed a novel data linkage of surveys including residential history data and publicly available neighborhood level eviction filing and judgement rates on a sizeable cohort of African American women. In an improvement over studies that use administrative data, our participants reported how long they lived in their during pregnancy neighborhood, and we were able to adjust for this and relevant individual level predictors of residential selection, as well as an objective neighborhood disadvantage index. While we cannot infer causality, our study is the first to document associations between neighborhood eviction filing and judgement trajectories- beyond single timepoint data- on odds of MPD and SPD and we focus on a priority population from a large Metropolitan area. This within racial group analysis allowed for the identification of a contextual, policy-relevant and modifiable risk factor for MPD and SPD during pregnancy among African American women.

### **Summary**

Our research question was grounded in RJ and we used a life-course approach to identify trajectories of neighborhood eviction filing and judgement rates over time that are associated with increased odds of MPD and SPD during pregnancy among a group made vulnerable by structural racism. The worsening African American maternal health crisis requires urgent action, including efforts to intervene on macro-social contextual risk factors for adverse maternal mental health.<sup>51,52</sup>

## References

1. Kemeny ME. The Psychobiology of Stress. *Current Directions in Psychological Science*. 2003;12(4):124-129.
2. Dunkel Schetter C. Psychological science on pregnancy: stress processes, biopsychosocial models, and emerging research issues. *Annual review of psychology*. 2011;62:531-558.
3. Kessler RC, Barker PR, Colpe LJ, et al. SCreening for serious mental illness in the general population. *Archives of General Psychiatry*. 2003;60(2):184-189.
4. Prochaska JJ, Sung HY, Max W, Shi Y, Ong M. Validity study of the K6 scale as a measure of moderate mental distress based on mental health treatment need and utilization. *International journal of methods in psychiatric research*. 2012;21(2):88-97.
5. Weissman J, Pratt LA, Miller EA, Parker JD. *Serious psychological distress among adults, United States, 2009-2013*. Vol 203: US Department of Health and Human Services, Centers for Disease Control and ...; 2015.
6. Dart RC, Surratt HL, Cicero TJ, et al. Trends in opioid analgesic abuse and mortality in the United States. *New England Journal of Medicine*. 2015;372(3):241-248.
7. Curtin SC, Hedegaard H. Suicide rates for females and males by race and ethnicity: United States, 1999 and 2017. 2019.
8. Rudd RA, Aleshire N, Zibbell JE, Gladden RM. Increases in drug and opioid overdose deaths—United States, 2000–2014. In. Vol 16: Elsevier; 2016:1323-1327.
9. Pamplin II JR, Bates LM. Evaluating hypothesized explanations for the Black-white depression paradox: A critical review of the extant evidence. *Social Science & Medicine*. 2021;281:114085.
10. Phelan JC, Link BG, Tehranifar P. Social conditions as fundamental causes of health inequalities: theory, evidence, and policy implications. *Journal of health and social behavior*. 2010;51(1\_suppl):S28-S40.
11. Phelan JC, Link BG. Is racism a fundamental cause of inequalities in health? *Annual Review of Sociology*. 2015;41:311-330.
12. Bailey ZD, Krieger N, Agenor M, Graves J, Linos N, Bassett MT. Structural racism and health inequities in the USA: evidence and interventions. *Lancet*. 2017;389(10077):1453-1463.
13. Pager D, Shepherd H. The sociology of discrimination: Racial discrimination in employment, housing, credit, and consumer markets. *Annu Rev Sociol*. 2008;34:181-209.
14. Howell J, Korver-Glenn E. Neighborhoods, race, and the twenty-first-century housing appraisal industry. *Sociology of Race and Ethnicity*. 2018;4(4):473-490.
15. Mah J. Gentrification-induced displacement in Detroit, Michigan: An analysis of evictions. *Housing Policy Debate*. 2021;31(3-5):446-468.
16. Raymond EL, Miller B, McKinney M, Braun J. Gentrifying Atlanta: Investor purchases of rental housing, evictions, and the displacement of black residents. *Housing Policy Debate*. 2021;31(3-5):818-834.
17. Desmond M. Eviction and the reproduction of urban poverty. *American Journal of Sociology*. 2012;118(1):88-133.
18. Desmond M, Kimbro RT. Eviction's fallout: housing, hardship, and health. *Social forces*. 2015;94(1):295-324.
19. Sealy-Jefferson S, Butler B, Chettri S, et al. Neighborhood evictions, marital/cohabiting status, and preterm birth among African American women. *Ethnicity & disease*. 2021;31(2):197.
20. Downing J. The health effects of the foreclosure crisis and unaffordable housing: a systematic review and explanation of evidence. *Social Science & Medicine*. 2016;162:88-96.
21. McGovern ME, Rokicki S, Von Jaglinsky A, Reichman NE. Neighborhood-level housing affordability and maternal depression. *SSM-Mental Health*. 2023;3:100192.

22. Vásquez-Vera H, Palència L, Magna I, Mena C, Neira J, Borrell C. The threat of home eviction and its effects on health through the equity lens: a systematic review. *Social science & medicine*. 2017;175:199-208.
23. Jokela M. Neighborhoods, psychological distress, and the quest for causality. *Curr Opin Psychol*. 2020;32:22-26.
24. Suglia SF, Duarte CS, Sandel MT. Housing quality, housing instability, and maternal mental health. *Journal of Urban Health*. 2011;88:1105-1116.
25. Hailu EM, Maddali SR, Snowden JM, Carmichael SL, Mujahid MS. Structural racism and adverse maternal health outcomes: a systematic review. *Health & Place*. 2022;78:102923.
26. Sealy-Jefferson S. Injustices in Black Maternal Health: A Call for Different Research Questions, Orientations, and Methodologies. *Frontiers in Public Health*. 2022;10.
27. Yang S, Kestens Y, Dahhou M, Daniel M, Kramer MS. Neighborhood deprivation and maternal psychological distress during pregnancy: a multilevel analysis. *Maternal and child health journal*. 2015;19:1142-1151.
28. Babenko O, Kovalchuk I, Metz GA. Stress-induced perinatal and transgenerational epigenetic programming of brain development and mental health. *Neuroscience and biobehavioral reviews*. 2015;48:70-91.
29. Glover V, O'Connor TG, O'Donnell KJ. Fetal Programming and Public Policy. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2023;62(6):618-620.
30. Mouzon DM, Taylor RJ, Nguyen AW, Chatters LM. Serious psychological distress among African Americans: Findings from the national survey of American life. *Journal of Community Psychology*. 2016;44(6):765-780.
31. Oakes JM, Fuchs EL, Tate AD, Galos DL, Biyoow IM. How should we improve neighborhood health? Evaluating evidence from a social determinant perspective. *Current Epidemiology Reports*. 2016;3:106-112.
32. Gong Y, Palmer S, Gallacher J, Marsden T, Fone D. A systematic review of the relationship between objective measurements of the urban environment and psychological distress. *Environment international*. 2016;96:48-57.
33. Fink DS, Galea S. Life course epidemiology of trauma and related psychopathology in civilian populations. *Current Psychiatry Reports*. 2015;17:1-9.
34. Kuh D, Ben-Shlomo Y, Lynch J, Hallqvist J, Power C. Life course epidemiology. *Journal of epidemiology and community health*. 2003;57(10):778.
35. Harrell SP. A multidimensional conceptualization of racism-related stress: Implications for the well-being of people of color. *American journal of Orthopsychiatry*. 2000;70(1):42-57.
36. Ross L, Solinger R. *Reproductive justice: An introduction*. Vol 1: Univ of California Press; 2017.
37. Sealy-Jefferson S, Giurgescu C, Helmkamp L, Misra DP, Osypuk TL. Perceived Physical and Social Residential Environment and Preterm Delivery in African-American Women. *Am J Epidemiol*. 2015;182(6):485-493.
38. Desmond M, Gromis A, Edmonds L, et al. Eviction lab national database: Version 1.0. In: Princeton, NJ: Princeton University. Available from [www.evictionlab.org](http://www.evictionlab.org); 2018.
39. Sampson RJ, Morenoff JD, Gannon-Rowley T. Assessing "Neighborhood Effects": Social Processes and New Directions in Research. *Annual Review of Sociology*. 2002;28(ArticleType: research-article / Full publication date: 2002 / Copyright © 2002 Annual Reviews):443-478.
40. Sealy-Jefferson S, Messer L, Slaughter-Acey J, Misra DP. Inter-relationships between objective and subjective measures of the residential environment among urban African American women. *Ann Epidemiol*. 2017;27(3):164-168.
41. Pearl M, Ahern J, Hubbard A, et al. Life-course neighbourhood opportunity and racial-ethnic disparities in risk of preterm birth. *Paediatric and perinatal epidemiology*. 2018;32(5):412-419.

42. Glasheen C, Colpe L, Hoffman V, Warren LK. Prevalence of serious psychological distress and mental health treatment in a national sample of pregnant and postpartum women. *Matern Child Health J.* 2015;19(1):204-216.
43. Johnson PJ, Jou J, Upchurch DM. Health Care Disparities Among U.S. Women of Reproductive Age by Level of Psychological Distress. *Journal of women's health (2002).* 2019;28(9):1286-1294.
44. Wen M, Shi L, Zhang D, et al. Racial-ethnic disparities in psychological distress during the COVID-19 pandemic in the United States: the role of experienced discrimination and perceived racial bias. *BMC public health.* 2023;23(1):957.
45. Khoury JE, Giles L, Kaur H, Johnson D, Gonzalez A, Atkinson L. Associations between psychological distress and hair cortisol during pregnancy and the early postpartum: A meta-analysis. *Psychoneuroendocrinology.* 2022:105969.
46. Coussons-Read ME. Effects of prenatal stress on pregnancy and human development: mechanisms and pathways. *Obstetric medicine.* 2013;6(2):52-57.
47. Entringer S, Buss C, Wadhwa PD. Prenatal stress, development, health and disease risk: A psychobiological perspective—2015 Curt Richter Award Paper. *Psychoneuroendocrinology.* 2015;62:366-375.
48. Graignic-Philippe R, Dayan J, Chokron S, Jacquet AY, Tordjman S. Effects of prenatal stress on fetal and child development: A critical literature review. *Neuroscience & Biobehavioral Reviews.* 2014;43:137-162.
49. Salameh TN, Hall LA, Crawford TN, Staten RR, Hall MT. Racial/ethnic differences in mental health treatment among a national sample of pregnant women with mental health and/or substance use disorders in the United States. *Journal of psychosomatic research.* 2019;121:74-80.
50. Desmond M, Shollenberger T. Forced displacement from rental housing: Prevalence and neighborhood consequences. *Demography.* 2015;52(5):1751-1772.
51. Melton-Fant C. Health Equity and the Dynamism of Structural Racism and Public Policy. *The Milbank quarterly.* 2022;100(3):628-649.
52. Neighbors HW, Mattingly DT, Johnson J, Morse K. The contribution of research to racial health equity? Blame and responsibility in navigating the status quo of anti-black systemic racism. *Soc Sci Med.* 2023;316:115209.

Table 1. Socio-demographic Characteristics of Study Participants and Bivariate Multinomial Regression Results for Odds of Moderate and Serious Psychological Distress (each compared to none) During Pregnancy; Life-course Influences on Fetal Environments Study, 2009-2011

	Total Sample N=808 N(%)	No Distress N=240 (29.7%) N (%)	Moderate Distress N=488 (60%) N (%)	Serious Distress N=65 (8%) N (%)	OR (moderate vs. none)	95% CI (moderate vs. none)	OR (serious vs. none)	95% CI (serious vs. none)
Age								
18-19	70 (8.7)	16 (6.7)	44 (9)	8 (12.3)	1.23	0.64, 2.35	1.67	0.61, 4.53
20-24	271 (33.5)	67 (27.9)	170 (34.8)	26 (40)	1.14	0.75, 1.72	1.29	0.65, 2.59
25-29	213 (26.36)	134 (27.5)	18 (27.7)		reference		reference	
30-34	146 (18.1)	50 (20.8)	88 (18)	6 (9.2)	0.79	0.50, 1.25	0.40	0.15, 1.08
35+	108 (13.4)	47 (19.6)	52 (10.7)	7 (10.8)	0.50	0.30, 0.82	0.50	0.19, 1.29
Marital status								
Single	364 (45.3)	92 (38.8)	223 (45.8)	44 (67.7)	reference		reference	
Married /cohabiting	439 (54.7)	145 (61.2)	264 (54.2)	21 (32.3)	0.75	0.55, 1.03	0.30	0.17, 0.54
Education (years)								
≤12	317 (43.7)	61 (25.4)	158 (32.4)	21 (32.3)	1.41	0.99, 1.99	1.40	0.77, 2.54
>12	561 (69.4)	179 (74.6)	330 (67.6)	44 (67.7)	reference		reference	
Income								
<\$35,000	409 (56.3)	106 (48.4)	249 (56.7)	43 (78.2)	1.40	1.01, 1.93	3.82	1.91, 7.64
≥\$35,000	317 (43.7)	113 (51.6)	190 (43.3)	12 (21.8)	reference		reference	
Time in during pregnancy neighborhood								



	466	122	296	36				
< 24 months	(58.5)	(51.7)	(61.4)	(56.3)	Reference		reference	
	331	114	186	28				
≥24 months	(41.5)	(48.3)	(38.6)	(43.8)	0.67	0.49, 0.92	0.83	0.48, 1.45
Study enrollment year								
	102	26		14				
2009	(12.6)	(10.8)	60 (12.3)	(21.5)	Reference		Reference	
	239	54	152	21				
2010	(29.6)	(22.5)	(31.2)	(32.3)	1.22	0.70, 2.13	0.72	0.32, 1.64
	467	160	276	30				
2011	(57.8)	(66.7)	(56.6)	(46.2)	0.75	0.45, 1.23	0.35	0.16, 0.74

No psychological distress is the referent group; N=15 (1.86%) missing for psychological distress, n=82 (10%) missing for income, n=5 (0.62%) missing for marital/cohabiting status, n=11 (1.36%) missing for time in neighborhood; OR=odds ratio; 95% CI= 95% confidence interval; N=number; vs=versus

Table 2. Correlations Between Eviction Filing and Judgement Rates in the Preconception and During pregnancy Neighborhood; Life-course Influences on Fetal Environments Study,

Variable #	1	2	3	4
1 Preconception Eviction judgement rate	1			
2 Preconception Eviction filing rate	0.73*	1		
3 During pregnancy Eviction judgement rate	0.25*	0.22*	1	
4 During pregnancy Eviction filing rate	0.20*	0.25*	0.70*	1
<b>Mean</b>	10.23	24.85	8.79	26.14
<b>Standard deviation</b>	7.37	16.12	6.87	16.53
<b>Median</b>	8.72	23.21	7	25
<b>(Minimum, Maximum)</b>	0, 48.39	0, 116.71	0, 59	0, 132

\*All correlations significantly different from zero ( $p < 0.0001$ )

Table 3. Distribution of participants in trajectories of preconception and during pregnancy neighborhood eviction filing and judgement rates; Life-course Influences on Fetal Environments Study, 2009-2011 (n=808)

Preconception/During pregnancy	Eviction Filing Rate Trajectories N(%)	Eviction Judgement Rate Trajectories N(%)
Low/Low	125 (15.5)	127 (15.7)
Low/Medium	71 (8.8)	77 (9.5)
Low/High	73 (9)	65 (8)
Medium/Low	79 (9.8)	84 (10.4)
Medium/Medium	110 (13.6)	96 (11.9)
Medium/High	81 (10)	90 (11.1)
High/Low	57 (7.1)	74 (9.2)
High/Medium	88 (10.9)	71 (8.8)
High/High	124 (15.4)	124 (15.4)

N=number; %=percent

Table 4. Preconception and During pregnancy Neighborhood Eviction Filing and Judgement Rate Tertile Categories and Associated Descriptive Statistics (n=808)

	Preconception			During Pregnancy		
Eviction Filing Rate	Low (n=269)	Medium (n=270)	High (n=269)	Low (n=261)	Medium (n=269)	High (n=278)
Mean	9.3	23.2	42	9.3	24.5	43.6
Median	9.8	23.2	37.9	10.0	24.0	40
SD	5.6	3.7	14.0	5.68	4.1	13.2
Range	0 – 17.2	17.2 – 29.3	29.3 – 116.7	0 - 17	18 – 31	32-132
Eviction Judgement Rate	Low (n= 269)	Medium (n=270)	High (n=269)	Low (n=285)	Medium (n=244)	High (n= 279)
Mean	3.5	8.9	18.3	2.9	7.2	16.2
Median	3.7	8.7	16.2	3.0	7.0	14.0
SD	1.9	1.5	6.7	1.7	1.09	6.39
Range	0 – 6.27	6.29 – 11.81	11.86 – 48.39	0 – 5	6.0 – 9.0	10 – 59

SD: standard deviation; Low: tertile 1; Medium: tertile 2; high: tertile 3; n= number

Table 5. Multinomial logistic regression results for associations between trajectories of neighborhood eviction filing and judgement rates and odds of **moderate** psychological distress during pregnancy among African American women; Life-course Influences on Fetal Environments Study, 2009-2011, n=808

		Eviction Filing Rate			Eviction Judgement Rate		
		n	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	n	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Low/Low		65		referent	71		referent
Low/Medium		40	1.31 (0.70, 2.44)	1.20 (0.61, 2.35)	45	1.36 (0.72, 2.57)	1.42 (0.72, 2.79)
Low/High		45	1.86 (0.97, 3.56)	1.75 (0.87, 3.54)	40	1.41 (0.72, 2.75)	1.45 (0.72, 2.94)
Medium/Low		48	1.57 (0.85, 2.89)	1.51 (0.79, 2.90)	57	1.57 (0.85, 2.90)	1.91 (0.98, 3.72)
Medium/Medium		73	2.39 (1.32, 4.30)	2.45 (1.29, 4.66)	68	1.96 (1.07, 3.60)	2.25 (1.16, 4.34)
Medium/High		55	2.16 (1.15, 4.05)	2.67 (1.31, 5.46)	60	1.73 (0.94, 3.20)	2.24 (1.11, 4.52)
High/Low		40	2.62 (1.25, 5.49)	2.12 (0.98, 4.62)	42	1.27 (0.67, 2.41)	1.24 (0.62, 2.49)
High/Medium		60	2.14 (1.16, 3.94)	1.74 (0.89, 3.43)	42	1.27 (0.67, 2.41)	1.39 (0.69, 2.79)
High/High		62	1.11 (0.65, 1.88)	1.22 (0.67, 2.24)	63	0.85 (0.50, 1.45)	1.10 (0.62, 1.98)
Adjusted for age, income, education, and length of residence in during pregnancy neighborhood, and neighborhood disadvantage index							

Table 6. Multinomial logistic regression results for associations between trajectories of neighborhood eviction filing and judgement rates and odds of **serious** psychological distress during pregnancy among African American women; Life-course Influences on Fetal Environments Study, 2009-2011 (n=808)

		Eviction Filing Rate			Eviction Judgement Rate		
		n	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	n	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Low/Low		7	reference		7	reference	
Low/Medium		11	2.48 (0.75, 8.18)	1.90 (0.55, 6.58)	11	3.37 (1.14, 9.92)	4.03 (1.18, 13.74)
Low/High		6	3.58 (1.10, 11.67)	1.60 (0.39, 6.55)	6	2.14 (0.63, 7.26)	2.17 (0.51, 9.29)
Medium/Low		3	2.13 (0.62, 7.28)	1.07 (0.27, 4.31)	3	0.84 (0.20, 3.55)	1.30 (0.28, 6.10)
Medium/Medium		5	4.25 (1.42, 12.69)	3.31 (1.04, 10.49)	5	1.46 (0.42, 5.13)	1.82 (0.46, 7.22)
Medium/High		6	1.70 (0.43, 6.67)	1.26 (0.27, 5.84)	6	1.75 (0.53, 5.84)	1.36 (0.28, 6.54)
High/Low		9	2.13 (0.46, 9.73)	1.45 (0.31, 6.87)	9	2.76 (0.90, 8.40)	3.11 (0.87, 11.05)
High/Medium		6	1.93 (0.53, 7.00)	1.15 (0.28, 4.70)	6	1.84 (0.55, 6.14)	2.65 (0.70, 10.10)
High/High		12	2.71 (0.96, 7.64)	1.95 (0.62, 2.24)	12	1.64 (0.59, 4.54)	2.35 (0.72, 7.71)

N= number with serious psychological distress; OR: odds ratio; 95% CI: 95% confidence interval; Adjusted for age, income, education, and length of residence in during pregnancy neighborhood, and neighborhood disadvantage index.