

## **Modern Echoes of Historic Institutionalized Racism: Associations Between Previously “Redlined” Districts and Current Obstetric Outcomes**

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**Objective:** To characterize the influence of historic racially discriminatory home loan practices (“redline”) on disparities in modern obstetric outcomes. Due to the critical role of home ownership in inter-generational wealth-building, the legacy of historic “redline” racial discrimination correlates with modern social inequities. Correlates with obstetric health disparities have yet to be explored.

**Study Design:** Retrospective cohort study of a 9 county birth certificate database from 2004-2017 merged with the 1940 Home Owners’ Loan Corporation (HOLC) map to directly associate modern obstetric outcomes with the regions classified by the federal government as “Best,” “Still Desirable,” “Definitely Declining,” and “Hazardous” for mortgage loan servicing based on racially discriminatory criteria (Figure 1). Each region was analyzed for primary outcome of preterm birth (PTB) and the secondary outcomes of obstetric and medical complications using Fischer’s exact test and ANOVA, followed by multi-variable regression for potential confounders.

**Results:** Of a total of 210,984 pregnancies, there were 64,804 within the 15 zip codes correlating with historic “Redlined” regions. PTB varied directly across the historic regions and reached significance for periviable birth ( $F=5.301$ ,  $p=0.0152$ ). Comparing the most to least “favorable” regions, secondary outcomes also worsened significantly (Figure 2). These effects on PTB remained significant on multi-variant regression correcting for income levels, poverty levels, educational attainment, and race however zip code distributions themselves remained significantly correlated with community income ( $p=0.0475$ ) and maternal white race ( $p=0.0442$ ).

**Conclusion:** These data demonstrate the modern obstetric impacts of historic policies driving inter-generational inequity. Fusion of historic and modern community datasets into obstetric datasets offers the opportunity to analyze the current health impacts of historic inequity. These data should inspire socioeconomic policies supporting economic vibrancy for all to ensure the best obstetric outcomes for our patients and their families.

Figure 1: Associating Historic Red-Line Map with Modern Obstetric Outcomes

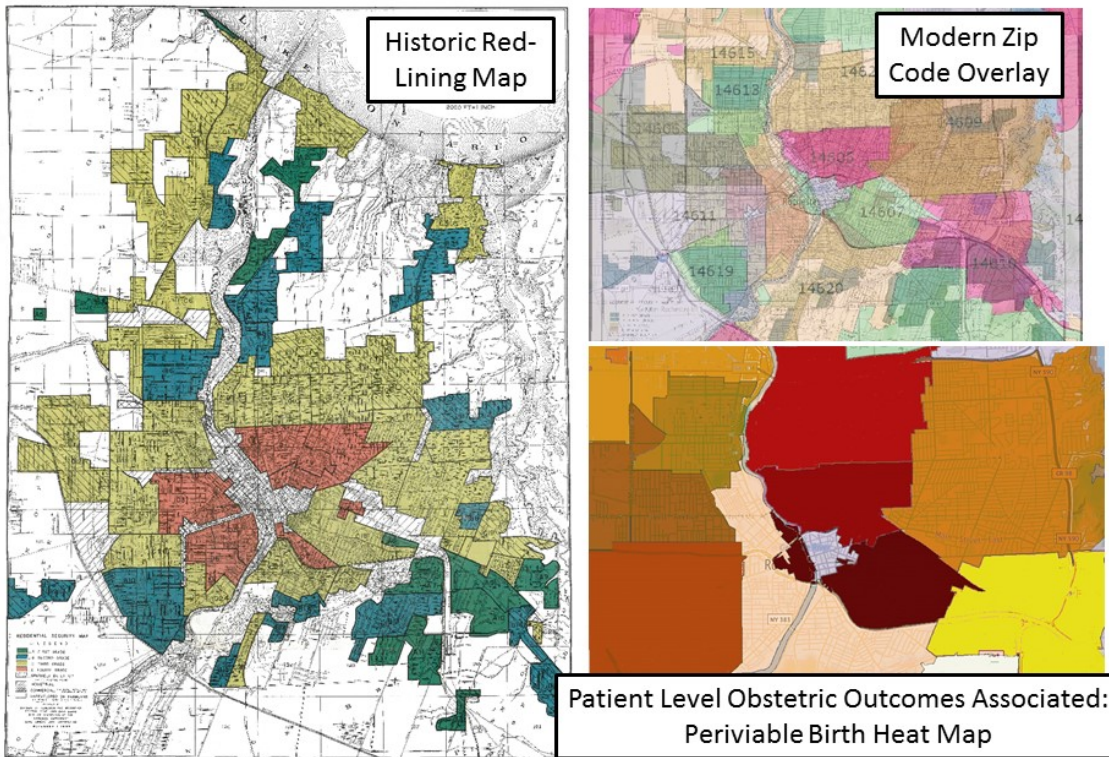
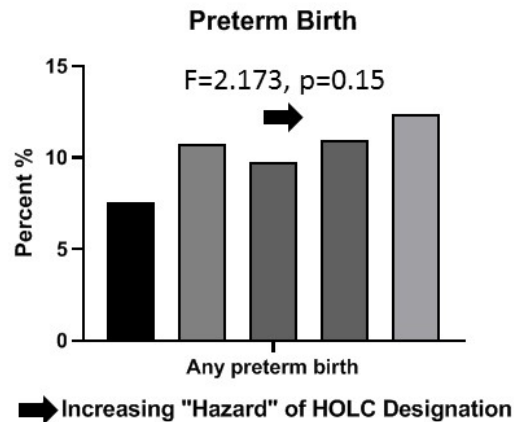


Figure 2: Preterm Birth in Zip Codes Grouped by Historic HOLC Designations

**Preterm Birth Incidence Organized by Historic HOLC Designation**

Historic HOLC Designation	Zip Codes	N	Preterm Birth		
			Births	Any PTB	Perivable birth
"Best"- "Still Desirable"	1	2873	7.55%	0.49%	0.24%
"Still Desirable"- "Definitely Declining"	5	27947	11.14%	1.30%	0.58%
"Definitely Declining"	3	14542	9.68%	0.91%	0.40%
"Hazardous" - "Definitely Declining"	2	6180	11.91%	1.62%	0.68%
"Hazardous"	1	3449	12.38%	1.36%	0.75%
Currently contain 3+ designation regions	3	9813	8.28%	0.70%	0.34%
<b>Total Cohort</b>	15	64804	10.36%	1.12%	0.51%
<b>Regional Population</b>	120	199088	9.48%	0.77%	0.36%



**Secondary Associations**

Outcome	OR (95% CI, p)
Pregnancy-associated hypertension	1.26 (1.031-1.523, p=0.023)
Severe depression	4.40 (3.15-6.17, p<0.001)
NICU admission	1.615 (1.38-1.90, p<0.001)
5 minute APGAR score <7	2.60 (1.685-4.02, p<0.001)
Substance use	16.37 (5.97-22.4, p<0.001)
Exclusive breastfeeding	0.118 (0.105-0.132, p<0.001)

